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USE OF NORMAL HORSE-SERUM AS A MEANS OF CONTROLLING HEMORRHAGE IN OTO-LARYNGOLOGY.*

DR. MAX A. GOLDSTEIN, SAINT LOUIS.

The development of radical and more extensive surgery of the nose and throat in the past decade, the frequency with which the surgery of this area is undertaken even by insufficiently experienced operators, the liberal vascular distribution in the mucous membranes supplying the tissues of these fields of operation, and the peculiar, soft and elastic anatomical structures involved in this special surgery have made the question of hemorrhage and its most effective control a consideration of extreme importance.

This is especially true in the extensive surgery of the nasal septum where most liberal resections of bone and cartilage are frequently undertaken; in the complete evisceration of the ethmoid labyrinth where the ramifications of cells are frequently followed instrumentally into the sphenoid areas and close to the orbit; in the thorough and intense curettage of the pharyngeal vault and lateral walls for the removal of adenoid tissue; and finally in the formidable, complete enucleation of the faucial tonsil which has supplanted the older tonsillotomy.

In accepting this more classical form of surgery in our practical work as the practice of to-day we have also assumed a greater responsibility with our patients; for we have exposed wider fields to

*Read at the nineteenth annual meeting of the American Laryngological, Rhinological and Otological Society, Washington, D. C., May 9, 1913.

infection, necessitated greater areas of repair and reconstruction and offered more opportunities for hemorrhage.

Technically the general surgeon has a comparatively easy task in the control of hemorrhage when the bleeding vessel can be readily located and ligated; the nose and throat surgeon encounters many handicaps in the control of hemorrhage because it is difficult to locate the bleeding vessel as in the deeper curettement of the ethmoid cells or sphenoid cavity where strips of gauze are packed more or less blindly into the bleeding cavity; it is at times inaccessible, as we have all experienced, in the mechanical control of hemorrhage in the vault of the pharynx following adenectomy where the complete tamponade of the post-nasal spaces and the anterior nares is at best a somewhat clumsy procedure; in the radical tonsillectomy where the bleeding is frequently from many smaller capillaries in the wounded faucial pillars rather than from an important vessel, and where chemical styptics, specially prepared tampons, mechanical tonsils hemostats, or even ligature of the faucial pillars must be undertaken.

Experience teaches us that many of these troublesome and nerve-racking hemorrhages may frequently be avoided by a more careful preliminary preparation of the patient. Simple adenoid curettement was formerly undertaken in our numerous clinics and even in private practice as an uneventful routine work. Patients were operated summer or winter, with or without anesthesia (local or general) and sent home shortly afterwards in dust, wind and weather. Tonsillotomy was performed as lightly as the spraying of the mucous membranes or syringing of the ear, and the patient was permitted to walk home or ride in a crowded street car without any thought of serious consequences. This was so frequently followed by earache, suppurative otitis, infections of the tonsillar regions, hemorrhage and other complications of a similar character that a reaction in the interest of the patient was found imperative.

To-day a greater discretion is exercised in the conduct of these operations, and adenectomy and tonsillectomy are justly regarded as surgical hospital cases. The patient is given preliminary attention similar to other surgical cases, is kept quiet, in bed, after the operation, and the surgical field carefully inspected from time to time.

Where the surgeon obtains previous knowledge of the hemorrhagic or hemophilic diathesis in a case to be operated, constitutional measures are also undertaken to guard against any possibility

of serious bleeding following operation. The time-honored therapy of administering calcium salts for a definite period preceding the operation has been given much attention. In the experience of the writer, it has, with few exceptions, proved of no practical value.

Gelatin-feeding is another classic therapy which, when persistently administered for many weeks, may be of some value in the conduct of a case of definite aneurysm, but can hardly be a matter of importance for the control of hemorrhage in nose and throat surgery.

The advent of serology and the study of the chemical and biological changes in the blood has opened another avenue of research which may be destined as an invaluable agent in the preparation of patients before operation and where hemorrhage is a possibility and where its physiological control may be more definitely exhibited.

As early as 1897, Bienwald reported the successful control of hemorrhage in a hemophilic patient following the injection of blood-serum. After a lapse of over five years Welsh re-awakened the interest of the profession in this valuable therapy by the unusual results which he obtained in the treatment of hemorrhage in the new-born. The literature of the past two years contains numerous contributions on the use of the sera of a large number of animals exhibited to control hemorrhage of varying degrees in many localities. There has been such a complicity of suggestions on the use of sera and such a melange of conclusions that it is now rather difficult to evolve a simple procedure and establish fixed principles in the employment of this therapy.

It has been definitely recognized that the coagulation-principle of the blood is dependent on the action of thrombin, the so-called fibrin ferment, on fibrinogen, one of the normal elements of the blood, in the presence of calcium. This has led to the theory that delayed coagulability or absence of coagulability might be due to the lack of sufficient calcium salt in the blood, and prompted the method of feeding calcium salts to the patient in whom hemorrhage was feared or in whom hemorrhage had ensued. This theory has been abandoned, and the exhibition of calcium salts is no longer the essential factor that it was ten years ago.

The study of thrombin and anti-thrombin, bodies and anti-bodies, and the fibrino-plastic elements of the blood have superseded the older theories in the question of hemorrhage and its possible constitutional control.

There are many local and constitutional causes of hemorrhage, but those that concern us especially within the limitations of this

paper are hemorrhage due to diminished or delayed blood-coagulation, increase of blood-pressure, and the various hemorrhagic and hemophilic diatheses; for it is assumed that the usual operations on the nose and throat are not undertaken in the presence of febrile, infectious, and pathological constitutional conditions.

With the resources of many valuable monographs, such as those of Solis-Cohen, Lescohier, White, Clowes and Busch, Rudolf, Duke, Hunter, Packard and others at hand, I have attempted to formulate a systematic plan of observation, technic and therapy, the results of which justify my presentaion of this subject in a somewhat empirical form.

My conclusions are based on a series of fifty cases which have been selected at random from private and clinic practice, irrespective of age or sex, or of the character of operation performed.

The accompanying record-card facilitates the collection of systematic data.

Name	Date
Address	Age.....Sex.....
Diagnosis	
Anesthetic	
Operation	

	Date	Date	Date
Blood Pressure:			
Systolic	m.m.	m.m.	m.m.
Diastolic	m.m.	m.m.	m.m.
Hemoglobin	%	%	%
Coagulation Time	min.	min.	min.
Urine:			
Albumin	.....	.....	.....
Sugar	.....	.....	.....

HISTORY:

Hemophilia.
 Chlorosis, pernicious anemia, leukemia, purpura, scurvy, malaria.
 Acute infections: typhoid, pneumonia, rheumatism, diphtheria.
 Exanthemata.
 Tuberculosis.
 Lues.
 Nephritis, arterio-sclerosis, diabetes, jaundice, gout, cancer.
 Menstrual irregularities.
 Previous serum or vaccine injections.
 Other diseases and further data.

The following details were carried out in each case:

Within twenty-four hours previous to the time of operation, (1) a physical examination of the patient was made; (2) the systolic and diastolic blood-pressure test was recorded; (3) the hemoglobin per cent noted; (4) the coagulation time ascertained of blood obtained from the lobe of the ear; (5) where the time-limit of the coagulation exceeded seven minutes a hyperdermic injection of 10 ccm. of normal, sterile horse-serum was given; (6) in each case where the serum injection was made the coagulability of the blood was again tested just prior to the time of operation.

The physical examination of the patient included a careful inquiry into a possible hemophilic diathesis, hemato-pathology, previous exanthemata, typhoid fever or diphtheria, menstrual irregularities, and the previous employment of sera or vaccine injections.

In the determination of the systolic and diastolic blood-pressure the Tycos sphygmomanometer was employed. The hemoglobin test was the simple method of Tallquist. Where an abnormal blood-count or hema-pathology was suspected a microscopic examination of the blood was undertaken at the same time. The method employed for measuring the coagulation-time of the blood was a modification of the simple method suggested by Duke. This apparatus was selected because of its simplicity, transportability, and fair accuracy. The description of my modification of Duke's equipment and the details of its use are furnished by Dr. T. O. Edgar, whose assistance in these observations I acknowledge with thanks:

"The time of coagulation in this test is based on the observation that a drop of blood on a glass slide will, when a certain stage in the process of coagulation is reached, maintain the same contour regardless of the

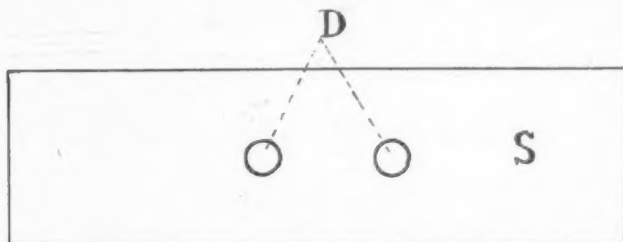


Figure 1. D. Glass disks. S. Glass slide.

obliquity of the slide upon which it is resting. The apparatus used is that devised by Duke and consists of a thick glass slide (Figures 1 and 2) on which is mounted two glass disks 5 mm. in diameter and about 1 mm. in height. The blood may be obtained after the usual technic from the finger or from the lobe of the ear. The latter procedure has been used in this work. If, after the site of puncture is cleansed carefully with soap and water and dried with alcohol, a thin film of vaseline is applied to the surface of the skin, the influence of contact of the blood with the skin will be lessened and the accuracy to that extent increased.

"In order to maintain as uniform a temperature as practical, the glass slide is placed in an inverted Petri dish and the latter floated in any large dish of glass or metal. An ordinary wash-basin will answer the purpose. An ordinary chemical thermometer is placed in the bottom of the basin for temperature observations. To prevent the thermometer from rolling, an ordinary pinch-cock or any other simple device may be uti-

lized. The temperature of the water is maintained at 38°C. or 39°C. by adding, from time to time, a little hot water from a pitcher kept within convenient reach. When all is ready, the slide and both sections of the Petri dish are placed for a few minutes in the water at 38° C. so as to impart to them the desired temperature. The slide is quickly dried, the ear punctured with a sharp lance and a drop of blood, when sufficiently large, allowed to touch the top of one of the disks. The remaining blood is immediately wiped from the ear and a second drop, obtained in the same manner, placed on the other disk. These two disks should have been numbered '1' and '2' by marking with glass-marking pencil or otherwise. Each drop of blood when mounted should be about 2 mm. in height, and if varying much from this height, should be replaced with-

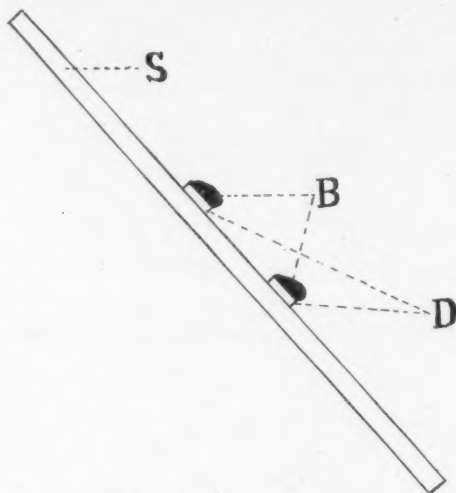


Figure 2. D. Glass disk. B. Drop of blood. S. Glass slide.

out delay by a fresh drop. The flow of blood should be free so as to obviate the necessity of any squeezing of the ear. Having noted the time of obtaining each drop of blood, the slide is at once placed in the Petri dish and floated as in Figure 3. At the end of five minutes and each minute thereafter, the Petri dish containing the slide is taken out of the water and held slantingly to observe the effect on the contour of the drop. Before coagulation has occurred a drop of blood will, when placed in this manner, lose the perfectly convex contour it has when horizontal (Figure 3), and assume a shape as shown in Figure 2. As soon as one of the drops maintains its contour regardless of the obliquity of the slide, the time is noted. If both drops are approximately of the same height the average elapsed time required by each drop may be taken as the time of coagulation. As an additional aid to show the approach of the desired

point, one will observe, when the drop is viewed by transmitted light, that a small opaque mass of fibrin appears and the latter always seeks the lower edge of the drop when the slide is tipped to one side; but when the point of coagulation is reached this mass remains near the center and its location in the drop is not affected by tipping the slide."

In the consideration of the appended table of the records of the fifty cases tested in this manner a number of definite conclusions may be drawn:

There is a definite and consistently constant reduction of the coagulation-time of the blood observed in this first series of fifty cases, irrespective of age, constitutional dyscrasia, blood-pressure or hemoglobin per cent, after the injection of normal horse serum. This reduction varies from one-half minute to three minutes by tests in which the blood-drop is maintained as nearly as practically possible in its usual physiological associations—namely, at uniform

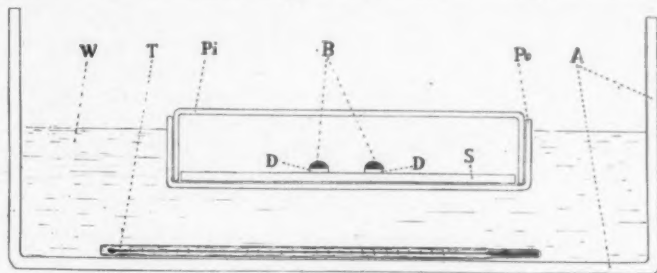


Figure 2. A. Large basin or glass dish containing water. W. Water. T. Thermometer. Po. Petri dish (outer portion). Pi. Petri dish (inner portion). S. Glass slide. D. Glass disk. B. Drop of blood.

body temperature and free from air, dust or other extraneous influence. It must be emphasized that this quite accurately-timed coagulation period is considerably decreased when the blood is allowed to coagulate under ordinary conditions. So, for example, the remaining blood-drop on the lobe of the ear, exposed to the air, thermal and chemical changes and static influences, coagulates long before the blood-drop that is being observed in the apparatus here described.

Five of this series of cases were operated under general anesthesia; forty of this series of cases were operated under local anesthesia; five of this series of cases were operated without any anesthesia. I operate under local anesthesia wherever possible, both in adults and children; use no adrenalin; no infiltration anesthesia, simply carefully pencilling or swabbing with 5 to 10 per cent cocaine, freshly prepared for each case. The five cases operated

GOLDSTEIN: HORSE SERUM TO CONTROL HEMORRHAGE.

No.	Name	Sex	Age—Years	Blood Pressure (in millimeters)		Hemoglobin Per cent	Coagulation Time (in minutes)		Diagnosis
				Systolic	Diastolic		Before Injection	After Injection	
1.	A.L.	M.	45	100	.....	95	6½	.....	Sup. O. M. Chr.
2.	K.V.	F.	5	.....	.....	85	9	7	Hyp. Tons.
3.	R.K.	M.	20	110	.....	100	6½	.....	Hyp. Tons.
4.	A.B.	M.	6	100	.....	95	10	7	Hyp. Tons. & Ad.
5.	G.V.	M.	30	120	.....	98	11	8	Peritons. Abscess.
6.	D.S.	F.	25	110	.....	100	8½	6½	Defl. Sept.
7.	D.C.	F.	35	125	.....	85	11	8½	Hyp. Tons.
8.	A.B.	F.	20	125	.....	80	10	8	Hyp. Tons.
9.	L.B.	F.	22	120	.....	90	6½	.....	Hyp. Tons.
10.	H.H.	M.	8	120	.....	90	10	7½	Hyp. Tons.
11.	H.C.	M.	35	125	.....	95	6½	.....	Defl. Sept.
12.	D.H.	M.	45	125	.....	95	7	6½	Chr. Ethmoiditis
13.	A.S.	M.	30	120	.....	70	12	11) 10)	Defl. Sept.; Hemophilic
14.	T.M.	F.	25	125	.....	93	7	.....	Hyp. Turb.
15.	N.P.	F.	10	125	.....	95	8½	7	Hyp. Tons.
16.	N.W.	M.	12	115	.....	95	8	6½	Hyp. Tons.
17.	J.D.	M.	5	100	.....	95	5½	.....	Adenoids
18.	L.M.	M.	7	110	.....	90	6½	.....	Adenoids
19.	S.W.	F.	8	120	.....	90	7	.....	Hyp. Tons. & Ad.
20.	M.L.	F.	16	125	.....	95	8	6½	Hyp. Turb.
21.	S.F.	F.	10	125	.....	90	9½	8½	Hyp. Tons. & Ad.
22.	C.S.	F.	32	130	.....	100	7	.....	Hyp. Tons.
23.	J.F.	F.	28	135	.....	100	10	8½	Hyp. Tons.
24.	R.D.	M.	5	110	.....	90	7	.....	Ad. & Hyp. Tons.
25.	D.G.	M.	12	110	.....	75	11	10) 9)	Adenoids, Hemophilic
26.	S.J.	M.	13	120	.....	95	7	.....	Hyp. Tons.
27.	L.S.	F.	27	125	.....	90	9	7½	Hyp. Tons.
28.	H.W.	M.	24	125	.....	95	8½	7	Def. Sept.
29.	F.D.	M.	52	.....	.....	7½	6½	.....	Hyp. Tons.
30.	H.C.	M.	50	.....	.....	7½	6	.....	Defl. Sept.
31.	E.D.	M.	38	.....	.....	7½	7	.....	Lues, 10 years ago.
32.	P.G.	F.	19	.....	.....	6	.....	.....	Hyp. Tons.
33.	V.C.	F.	24	110	.....	90	7	6	Hyp. Tons.
34.	P.H.	M.	7	120	.....	95	7½	6½	Hyp. Tons.
35.	M.P.	F.	8	120	.....	95	6½	.....	Hyp. Tons. & Ad.
36.	T.S.	F.	8	130	.....	90	8	5½	Hyp. Tons. & Ad.
37.	D.B.	M.	3	.....	.....	85	7½	.....	Ad. & Tons.; Lymph. Diath.
38.	M.B.	F.	4½	.....	.....	90	7	.....	No Anesthesia
39.	A.R.	M.	3	.....	.....	90	7½	6½	Her. Syph.
40.	R.J.	M.	11	.....	.....	95	6	.....	Hyp. Tons. & Ad.
41.	S.F.	F.	10	125	.....	90	8	7½	Ad. & Tons. (Same as 21).
42.	A.P.	F.	28	125	.....	90	8½	7	.....
43.	P.W.	F.	4	.....	.....	90	8	7	Lymph. Diath.
44.	R.W.	F.	3	.....	.....	90	7½	7	Lymph. Diath.
45.	H.L.	F.	6	.....	.....	95	7	.....	.....
46.	A.B.	M.	5	.....	.....	90	7	6	.....
47.	H.W.	F.	4	.....	.....	6½	6	.....	Her. Syph.
48.	R.C.	M.	45	.....	.....	9½	6½	.....	Def. Sept.; Diph. 2 yrs ago.
49.	S.R.	F.	11	.....	.....	8	6½	.....	Diph., 1 year ago.
50.	N.B.	M.	15	.....	.....	8½	6	.....	Diph., 9 months ago.

*Microscopic blood examination made in this case.

†Lymphatic diathesis; mental defective; operation deferred; see Case 41.

‡Microscopic blood examination made in this case. Since this table has been compiled six additional injections of sterile horse-serum have been administered in this case, the recurrent bleeding has ceased, and no anaphylaxis has occurred

without any anesthesia were of the lymphoid diathesis or status lymphaticus, a condition in which, in my opinion, anesthesia is absolutely contraindicated.

The greatest reduction in coagulation time ($2\frac{1}{2}$ to 3 minutes) was noticed in three cases, all of which had contracted diphtheria within two years of the time of testing, and all of which had been injected with diphtheria anti-toxin during the diphtheritic attack. This may be significant of some potent change in the blood, continued for some time and still influencing the coagulation period.

In one case where lues was acquired ten years ago, and two cases of hereditary lues, the coagulation-time was very short, by comparison, before and after using the serum (one-half minute in each case). Possibly this also demonstrates a reduced fibrino-plastic influence because of the associated lues.

In the lymphoid types, also, the short coagulation time was very marked. In four of the cases in which the serum was used, the reduced coagulation-time did not exceed one minute.

In no case has there been active bleeding of any kind after the patient left the operating-table. There has been no secondary hemorrhage. In the tonsillectomies, not even the formerly frequently observed surface oozing has been noticed; in the septal resections the dressings (I pack both nares for 24 hours) were markedly less sanguinous and I have found less occasion to repack for troublesome oozing or slow bleeding which I often formerly had when removing the first dressings.

Most of these cases are taken from private practice and I have had ample occasion to watch them carefully.

There is no doubt of the efficacy of fresh, normal, sterile horse-serum as a direct agent to reduce the coagulation-time of the blood, as is evidenced in such a large percentage of this series of cases. Packard, in commenting on the stability of serum-injection for the control of hemorrhage in a hemophilic boy on whom he had performed a bilateral tonsillectomy, records the injection of several doses of plain horse-serum without effect, and demonstrates the improvement of this patient after an injection of freshly-drawn rabbit's serum.

Such results may depend on the age of the serum, for there is undoubtedly deterioration in potency after a certain period. The selection of an efficient serum is as important in this therapy as is the selection of a fresh antitoxin in diphtheria.

The serum that I have used in these investigations has been kindly prepared for me by the research laboratories of the Parke Davis

Company and of the H. K. Mulford Company, in 10 ccm. containers, syringe-form, equipped with sterile hypodermic needles, ready for use. Serum for this purpose should bear the date of preparation, and should not be more than three months old, for it is likely that changes in the anti-bodies may be exhibited in old serum similar to those which have been described in antitoxins.

There is another source of faulty therapy in the use of sera for the control of hemorrhage. Several observers have reported their experience with sera in individual cases of hemorrhage and have expressed doubt as to the efficacy of such sera. It must be emphasized, however, that in these cases the serum was used *after* the hemorrhage had ensued and not prior to the operation or time of hemorrhage. The effect of heterogenous sera as an agent to control hemorrhage is not always demonstrable within a few hours after injection but requires a longer period of time (twelve to twenty-four hours) for the modification of the fibrino-plastic elements which it influences. Such sera, therefore, must by preference be used as a preventative therapy and injected from twelve to twenty-four hours prior to the operation and not as an emergency measure or "court of last resort" when all other resources have failed.

Anaphylaxis is a complication which I have always had in mind, for in several instances of hemophilia I gave three successive injections in one case and four in another. These injections were from twelve to twenty-four hours apart and were continued until a reduction in the coagulation-time of the blood was definitely observed. All of these injections were made prior to the time of operation. No symptoms of anaphylaxis have been observed.

In two cases (one a child of 6 and the other an adult of 24) a latent rash or urticaria was noted. In the child it was a diffuse rash first appearing six days after the injection of the serum and lasting for about thirty-six hours; in the adult a roseolar rash was found about the neck and shoulder on the second day following the injection, of about twenty-four hours' duration.

While these investigations have not yet been extensively enough conducted to permit of any hard and fast lines being drawn for the employment of serum as an independently effective agent for the control of hemorrhage in all cases of surgery of the nose and throat, yet I feel justified in the claim that when used systematically as a prophylactic or preventative measure as herein set forth, and in conjunction with a simple and fairly accurate method of noting the coagulation-time of the blood, together with the determination of

the blood-pressure, we have a most potent and valuable ally in the control of hemorrhage.

Clinically I can offer only my own experience in disposing of the question of hemorrhage before and since my use of sera. Formerly, whether I used the guillotine in any of its modifications, tonsil-knife and tenaculum-forceps, scissors, or the various forms of snares in a tonsil enucleation, I was never certain when or where I might be called back to the patient to combat a troublesome hemorrhage. To-day I use the serum-therapy as above outlined as a routine procedure and systematically test the coagulation-time in each case and whenever the coagulation-time exceeds seven (7) minutes, the serum is injected. When I have taken this precaution, avoided the use of adrenalin and the active mechanical disturbance of tissues by infiltration anesthesia, completed the tonsil enucleation with the Pierce-Mueller snare, dissector and volsellum forceps, I feel that my patient can be safely left without fear of hemorrhage.

3858 Westminster Place.

Treatment of Vincent's Angina. J. CITRON, *Berl. klin. Wchnschr.*, April 7, 1913.

A trituration of salvarsan in glycerin (0.1 to 5 ccm.) was applied locally for three days in two of Citron's cases with a resulting permanent cure of the lesions at the end of five days. Ed.

Angioma of Larynx, Especially its Relation to Chronic Laryngitis, with a Report of a Case in a Child Nine Months Old, Following Measles. Review of Literature. JOHN PHILLIPS, *Am. Jour. Dis. of Child*, Feb., 1913.

The case reported was a child, 9 months old, who, following measles, developed hoarseness, difficulty in breathing, and a croupy cough. The symptoms gradually increased, pneumonia developed and the child died. On examining the larynx, post-mortem, there was only a slit between the cords, the space being filled up with an irregular growth, reddish-gray in color, which extended down into the larynx. The microscopic examination showed it to consist principally of a mass of thin-walled vessels filled with blood.

HALSTED.

HISS LEUCOCYTE EXTRACT IN COMPLICATIONS OF NASAL AND AURAL SURGERY.*

DR. W. H. HASKIN, NEW YORK CITY.

In 1910, my associate, Dr. J. G. Dwyer, published a most valuable paper on the use of vaccines, serums and the Hiss leucocyte extract, and it is with the further use of this extract that this paper will deal. In the death of Prof. Hiss the profession has lost one of its most brilliant, enthusiastic and scientific members. His first report on this extract was published in the *Journal of Medical Research*, in November, 1908, and gave in detail the results of his experiments and the exact method for the preparation of the extract. His work had extended over a period of two years, so that even in his first paper he only offered a thing that had actually been tested and had given results.

It has been asked a thousand times, "Why hasn't he published his further work?" The only answer is that he was almost totally deaf and suffered with the extreme diffidence that these unfortunates so often have, and also, it is probable, that he knew that he was a doomed man for nearly four years, dying as he did from multiple melanotic sarcoma, which had destroyed one eye about a year and a half before his death. He has left a monument with us which is sure to prove one of our greatest mainstays. It may be that his extract as prepared to-day will not continue in use, but there is no question but that the principles upon which he worked and formed his theories are absolutely logical and that any further investigations along this line will be the direct result of his legacy, and therefore credit should be given him for his discovery. After his assistant, Dr. Hans Zinnser, went to California in 1909, Prof. Hiss became still more diffident and retired almost entirely into the seclusion of his laboratory. He told me several months before his death, that had not Dr. Dwyer come into his life, any further work with the extract would probably have stopped in 1910. A very strong friendship arose between them in 1910 and for the first time Prof. Hiss had a man follow up the clinical use of his preparation in whom he had entire confidence so that the many trials in actual practice have been due to Dr. Dwyer's enthusiasm and devotion to Prof. Hiss who never would go out to see a case himself but always sent his

*Read at the nineteenth annual meeting of the American Laryngological, Rhinological and Otological Society, Washington, D. C., May 8, 1913.

new-found friend. As Dr. Dwyer has been with me both in my office and hospital work ever since he entered practice, it is very natural that I, too, have become an ardent believer in the efficacy of this product, and have asked to read this paper only after being told that it could not be presented by Dr. Dwyer to whom so much of the credit is due for the brilliant results that have been procured.

It is necessary to read Prof. Hiss' theoretical considerations which led to his experimental work upon leucocyte extracts and infections, in order to fully understand the rationality of his work. He says that: "In thinking over this work I came to the conclusion that in many diseases we are probably dealing with an immunity a large part of whose mechanism is individually cellular, not only in the sense of phagocytosis and digestion, but in the neutralization of poisons given rise to by the disintegration of the bacteria—a mechanism in which the protecting cells must intervene and unaided by bodies in the plasma neutralize within themselves the poisonous products of the invading micro-organisms. It was this thought that gave rise to the further idea of aiding the leucocytes by furnishing them as directly as possible with the weapons which were being taken away from them in their fight with invading micro-organisms and to thus protect them from destruction and give them an opportunity to recuperate and carry on successfully their struggle against the invading germs. These weapons, whatever might be their nature, I assumed might possibly be furnished by an extract of the active substances of the leucocytes themselves (substances not ordinarily given up to the plasma or serum) and I also assumed that extracts would be more efficacious than living leucocytes themselves, introduced into the infected animal, since being diffusible they would probably be distributed impartially to all parts of the body by the circulatory mechanism and, as quickly as absorption would permit, relieve the fatigued leucocytes and protect, by any toxin-neutralizing or other power they might possess, the cells of highly specialized functions.

This idea of immunity differs from one that simply assumes the cells as the source of all immune bodies (which logically seems to be the case) in that it takes into consideration the presence and production in the leucocytes of agents which are not normally given up to the plasma, but which are constantly able to reproduce themselves and carry on the functions of digestion or neutralization simply for the benefit and protection of the individual cell, while not

being secreted or excreted by the cells for the more general benefit of the cell community at large.

"Thus we have a differentiation of immune agents into those which by virtue of their liberation and over-production by the cells, such as the anti-toxins, amboceptors, and agglutinins, etc., are free in the plasma and thus, when active, are immediately available for the protection of all the body cells; and into those agents by which certain cells primarily nourish and protect themselves, and are only of benefit to the cell community at large by virtue of the direct intervention of these cells between the invading germs and their products and the highly specialized cells requiring protection. It seems, then, that when these sources of protection are overtaxed or fail to act efficiently, on account of some inherent weakness or untoward circumstance of location, that the most reasonable course is, if possible, to support the chief army of attack as indicated by a study of the exudates and pathological changes in the disease in man and animals, and to endeavor to supply those products which are most heavily taxed in the fight, in other words, to introduce into the infected animal or man the substances composing the chief cells or all the cells of an exudate in the most available form and as little changed by manipulation as possible. Such substances, if they become free from the cells by extraction, might serve to neutralize poisons in the blood, might alone or in combination with bodies already in the blood act deleteriously on the bacteria, and thus protect and augment the activities of the flagging leucocytes by supplying them with their own weapons in the fight against the invading organisms. And further, the extracts of such exudates from previously immunized animals might even better serve this purpose, since their cells probably have, in their own fight against the same organisms gained increased powers, as is evidenced by the ability of such immunized animals to safely dispose of immense numbers of organisms without serious harm or loss of weight. Also, as a further adjuvant, immune sera might be found serviceable in some cases, especially early in the disease and when non-immune cells are being used, although it is our belief that sufficient immune bodies (bactericidal or bacteriolytic) are often present, and in sufficient amount even early in the disease, if the animal economy has not been entirely overwhelmed by an enormous primary dose of the infecting organisms or their poisons."

His paper gives the results of the curative influence of the extract in animals with staphylococcus, streptococcus, pneumococcus,

meningococcus and typhoid bacillus; it also reports the result of its use in twenty-four cases of meningitis in man, and its use in acute lobar pneumonia in man.

His original results have been so fully borne out since then in over 400 cases of various infections, most of them desperate ones, that it seems as though the time for doubt has gone and that we should all learn when and how to use it to the best advantage of the patient and not turn to it only as a last resort. Even a month ago two of our most prominent otologists asked me to tell them about this vaccine. It is not a vaccine or antitoxin in any sense of the words and should not be confused with them as is constantly done. My own experience with three desperate cases, all being in the hospital at the time, gives most marked evidence of its value.

Case 1: On February 18, 1913, Sol. Z., aged 1 year, was brought to my office, being referred by Dr. H. S. David. The child had been very ill for over five weeks running temperatures up to 105° , and with both ears discharging very profusely. The physician in charge had opened the drums several times, but failed to realize the gravity of the case and Dr. David, being a friend only, advised the parents to see me. Examination showed undoubted involvement of both mastoids, with extreme contraction of both pupils and a very suspicious, rigid contraction of the muscles of the neck. He was sent to the Manhattan Hospital at once and operated upon within two hours. Both processes were completely disintegrated and the sinus on the left side appeared to be almost necrotic for about half an inch. An attempt was made to draw off some spinal fluid but the syringe filled with blood, or at least a dark fluid which coagulated very rapidly. At the time this gave us some uneasiness, but Dr. Ende, of the Central Islip Hospital for the Insane, assured Dr. Dwyer that this was not an infrequent occurrence in his work at the hospital, and I have seen another such case since then. Blood was drawn during the operation for culture and proved to be negative. All possible speed was used, in order to lessen the shock as much as possible, and the patient was taken off the table at the end of thirty-five minutes. That night the temperature rose to 106° and the leucocyte extract was given and continued daily for seven days.

The temperature became lower, but remained around 102° for several days. A pediatricist was called in on the seventh day to determine whether there might not be some general systemic condition that was keeping up the temperature, but he found nothing. The child improved slowly but on the twenty-fifth day a large

trophic slough was discovered over the torcula and a day later another smaller one appeared near it on the left side. Up to this time both mastoid wounds had been doing very well, but then healing seemed to stop and the granulations became very flabby and unhealthy. The extract was again administered for three days with remarkable effect, both the wounds and the sloughs assuming a healthy appearance and going on from that time to complete healing at the end of the fifth week. This brief report cannot convey any idea of the desperate conditions we had to deal with and that the child recovered is entirely due to the power of the extract in giving strength to the overtaxed body of this profoundly infected child.

Case 2: John K., aged 2 years, was brought to Dr. McKernon's clinic on March 19, 1913, with a large subperiosteal abscess of ten days' duration, and was operated upon the same afternoon (*staphylococcus aureus*). His temperature at the time of operation was 103° , but fell to normal the following day and remained there until the fourth day. He then became suddenly ill and the temperature rose to 104° , pulse 136, and respirations 38, and this was accompanied by a constant cough. An examination of the chest showed marked crepitations over the lower right lung and a blood count showed 43,000 leucocytes, 75 per cent polynuclear and 25 per cent mononuclear cells. Ten cc. of the extract was given at once and repeated on the next day. It sounds like a fairy tale for me to tell you that the temperature fell at the end of forty-eight hours and that the lung conditions cleared up without going on to consolidation, but that is what happened and the same thing has happened in two other cases in which Dr. Dwyer was called and administered the extract. This child recovered rapidly and the mastoid wound was healed at the end of the third week.

Case 3: This case is the most remarkable, however, as it shows the cure of a *streptococcus capsulatus mucosus* bacteremia without operative measures. Jacob P., aged 6 years, was brought to Dr. McKernon's clinic on February 19, 1913, with the history of pain in the right ear of several days' duration but with no discharge. The previous history was negative. His father said that he had been having high fever and when seen the temperature was 104° . As there was no vacant bed in the hospital, a paracentesis was performed but no fluid escaped, although the membrane was very red and had appeared to bulge. On the following day he was admitted into the hospital with a temperature of 104° . The pain in the ear

had subsided and there was no tenderness over the mastoid, nor was there any thickening of the canal walls or other indication for operation except the high septic temperature. His blood count showed 16,000 leucocytes with 76 per cent polymorphonuclear and 23 per cent mononuclear cells. On February 19, he complained of severe pain in his left shoulder but this shifted to the right hip and groin on the next day, and Dr. Hutton, the attending physician, was asked to examine him. He reported: "That in the absence of any history it appeared to be a case of inflammatory rheumatism, but that the possibility of periostitis and osteomyelitis were not remote possibilities." Sodium salicylate was given for three days but without any effect. On February 21, the blood count showed 25,000 leucocytes, with 71 per cent polynuclear and 29 per cent mononuclear cells. A blood culture was ordered, but owing to some error was not taken until February 23, at which time the blood count showed 24,000 leucocytes, with 81 per cent polynuclear and 19 per cent mononuclear cells.

On February 22, a marked endocarditis was discovered affecting the aortic valves. Dr. Phillips saw the case with me, being the only surgeon in the hospital at the time, and advised against any operative measures. I should say that Dr. Rae had seen the case with me on two occasions and had also advised against operating, as we had nothing but the high temperature to indicate involvement of the mastoid. By February 23, there was marked thickening around the right groin and Dr. Berg, of Mt. Sinai Hospital, was called to see him. He found the condition to be a profound sepsis, but advised against any operative procedure at the hip for the time being at least. On February 24, our pathologist reported a marked bacteremia, the cultures showing numerous growths of an hemolytic streptococcus, this was later differentiated as the capsulatus mucosus. The leucocyte extract was then given daily in 10 cc. doses. An improvement was at once noted and there was a daily drop in the temperature, as shown by the chart. On February 27, the leucocyte count showed 11,500 leucocytes, with 75 per cent polynuclear and 25 per cent mononuclear cells, this being a most remarkable change showing the increased resisting power of the blood by the decrease in the total leucocytosis as well as the decrease in the polynuclear and the increase in the mononuclear cells, which Prof. Hiss claimed to be the most active bodies in resisting invasion by organisms. On February 28, after only five days use of the extract, a blood culture was found to be absolutely negative, even

after forty-eight hours in the incubator, on four different media. On March 2 and 3 he was given more of the extract although there was no special indication, it being administered to aid the leucocytes in their efforts in throwing off the results of the profound sepsis which had been present.

On March 6 another blood count and culture were made and proved that the bacteremia had been overcome without any doubt, the culture being again absolutely negative, and the differential count showing a still further improvement, as follows: leucocytes, 13,000; polynuclears, 67.5 per cent; mononuclears, 31 per cent, and 1.5 per cent transitional forms. With this improvement in the character of the blood there was a corresponding change in the child himself. The heart murmur had almost disappeared, his appetite was good, he was happy and became a ward favorite with his sunny smile and good nature; but although all the swelling around the hip and groin had gone, he could not bend the hip to sit up, complaining of severe pain. On March 21, Dr. Phelps kindly applied a plaster casing around the body and the right thigh and after another blood culture and count showed well, (that is, good resistance and negative for bacteria), he was discharged and was taken home. Just what was present in or around the hip no one could say. An x-ray showed nothing and an exploratory puncture was unsuccessful in withdrawing any fluid. This case is remarkable and also unique in that it is the only case on record, so far as I know, of a cure of an actual streptococcic bacteremia without any operative measures having been used. There is no doubt but there would have been a fatal result in this case had it not been for the efficacy of the extract, for no one can appreciate the actual profound sepsis of the patient except those who watched him from day to day.

It was felt that two of these cases would terminate fatally, and the abortion of the pulmonary consolidation in the third was a most unusual and unexpected ending. As the extract was the only remedy used in all three cases, their recovery was surely due solely to its influence. In two other cases of pneumonia, occurring in the practice of other physicians, the attacks were cut short in much the same manner as in the one reported above, the extract being administered very early in the attack, so that it seems as though its future use, when given early enough, will prove a great blessing. Dr. Dwyer has kindly prepared a record of cases in which the extract has been used in the practice of a large number of physicians.

each of whom have sent in their bedside-notes with the reports of their cases. He personally saw most of the cases before giving the first dose, and the writer has marvelled at the recovery of many of them after hearing of their original condition.

In erysipelas and in true lobar pneumonia it acts in many cases as though it were a true specific, the relief to the patient being felt very quickly after the first injection. It should not be necessary for me to say that it is not, strictly speaking, a specific for anything. There is invariably a fall of temperature with a marked improvement of the heart beat. Delirium generally disappears rapidly and the patient tells of his relief and feeling of increased strength from the beginning. During the past year over 1,000 rabbits were used, each giving an average of 30 ccm. of the extract. As the average dose has been 10 ccm., this will give some idea of how extensively it has been used, and I wish it were possible to read some of the many personal letters that have been sent by the physicians who have used it. Even the faculty of the College of Physicians and Surgeons, in whose laboratory all of the extract has been prepared, had no idea of the extent to which it had been used or of the brilliant results obtained, until after Prof. Hiss' death and Dr. Dwyer was asked to give them a full report of the work that had been done. For years Prof. Hiss bore the entire expense of preparing and furnishing his preparation, for he refused to proclaim his work until clinical results would prove its value. It should be borne in mind that this is not, in any sense, either a vaccine, anti-toxin or specific. It has no connection whatever with any bacteria, but is purely a physiological extract and emulsion of the leucocytes themselves, which, on being injected into the cellular tissues, is taken up into the circulation and furnishes food to the overtaxed and exhausted leucocytes in the body, thus allowing them to renew their fight in overcoming the effects of the toxins and even the living organisms which may be present in the system.

The necessary dosage for any one or for all cases cannot, as yet, be given definitely. No two cases ever present exactly the same clinical pictures, so that each case must be a problem in itself and the successful use of the extract will depend upon an intelligent administration after careful examination of the heart and in many cases upon the correct interpretation of a differential blood count, which will always show the resisting power of the blood. The writer feels that a large number of patients would be greatly helped in their convalescence, if careful counts were made frequently and the extract were administered whenever diminished resistance was

shown by such counts. One important factor in its favor is that it has never been known to have produced any bad effects; it invariably increases resistance, and even in those patients who have not been saved the fatal end has been delayed many days. No medicine has ever been put to more severe tests than has this extract, Dr. Dwyer not being called to see the cases, generally, until they were almost *in extremis* and it was felt that nothing could save them.

Now that proof of its great value in most desperate cases is undoubted, it is to be hoped that the rationality of its use will be recognized by all, and that the many laboratories connected with our hospitals will take steps to prepare the extract for themselves and so be able to keep a supply constantly on hand to be used, not as a last resort, but to prevent the complete overpowering effects upon the patients of toxins or bacteria, and their products, that, with the aid of the extract, he should be able to throw off before his resistance becomes so lowered that nothing can save him. The method of preparation was given in detail by Prof. Hiss in his first paper, that of 1908, and is practically the same at the present date except that it has been found that it could be put out in twice the original strength without injury to the cellular tissues and for the past two years that has been done.

Dr. Dwyer has kindly prepared the following table: "This series of 39 cases occurring in nasal and aural diseases have been treated with the leucocyte extract: 1. Sinus-thrombosis, without positive blood-culture, 11 with 9 recoveries and 2 deaths. 2. Sinus-thrombosis with streptococcus in the blood-culture, 3 recoveries and 2 deaths. 3. Sinus thrombosis with streptococcus mucosus capsulatus in the blood-culture, 1 ending in death. 4. Septicemia: (a) Streptococcus mucosus capsulatus, 1 ending in recovery; (b) streptococcus pyogenes with acute endocarditis, 3 and all recovered; (c) pneumococcus, with acute middle ear, pneumonia and endocarditis, 1 case with recovery. 5. Clinical septicemia with endocarditis, following mastoiditis, 3 cases with 2 recoveries. 6. Meningitis: (a) Serous meningitis, 3 cases all recovered; (b) purulent meningitis, with the organism demonstrated in the cerebro-spinal fluid, 3 deaths and 1 recovery. 7. Mastoiditis complicated by pneumonia, 3 cases, all recovered. 8. Frontal sinusitis, complicated by clinical meningitis, 1 case with recovery. 9. Streptococcus sore throats, 5 with quick recovery in each.

This series is limited strictly to aural and nasal diseases and their complications, but in addition to the above we have a whole series of cases of septicemia and such conditions due to infections in other

parts of the body and our results on the whole are just as favorable.

We have, besides, a series of 148 cases of all kinds of erysipelas and will give the analysis of the results obtained in this series of cases.

STATISTICAL ANALYSIS OF ERYSIPELAS CASES.

Age of Patient	No. of Cases	Time of Treatment	Average Duration of Treatment		Termination of Cases	
			Early*	Late	Recovery	Death
Infants		Early*	5		3	2
(up to 1 year).....	12	Late	7	6 days	5	2
Children		Early	5	1.5 days	5	
(1-15 years)	14	Late	9	3 days	9	
Adults		Early	44	2.2 days	44	
(15-50 years)	110	Late	66	3.5 days	66	
Over 50 years.....	12	Early	5	1.5 days	5	
		Late	7	3.7 days	6	1
Total	148	Early	59	2.3 days	57	2
		Late	89	4.05 days	86	3

*Early—Treatment begun within three days of appearance of lesion.

Late—Treatment begun later than three days after appearance of lesion.

RECAPITULATION.

Total number of cases treated—148; recovered 143; mortality 3.39%.

General average duration of treatment—3.18 days.

Number of recoveries under 1 year old—8 out of 12.

Per cent of recoveries under 1 year old—66.6%.

General mortality rate—(all cases) 3.39%.

Mortality among patients over 1 year—73%; recoveries 99.27%.

40 East Forty-first Street.

Carcinoma of the Tongue Following Epidermolysis Bullosa (Dystrophic Form). KLAUSNER. *Arch. f. Dermatol.*, Bd. 116, Heft 1, 1913.

In a girl of 25 years suffering from epidermolysis bullosa, carcinoma of the tongue developed. The author feels that supersensitiveness and disturbances in the anlage of the epithelium which occasionally, in cases of epidermolysis bullosa, lead to thickening of the mucous membrane or leucoplakia were in this case responsible for the glossal carcinoma.

ED.

**REPORT OF A CASE OF NASAL POLYPI INVOLVING
THE ORBIT, FRONTAL SINUS AND ANTERIOR
FOSSA OF THE SKULL.***

DR. WM. R. CHAMBERLIN, CLEVELAND, OHIO.

The following case is unique in my own experience. In a rather careful review of the literature I have been unable to find any similar condition described. I therefore venture to report it more or less fully.

Wm. G., aged 41, was referred to me on October 18, 1912, on account of a discharging sinus beneath the left eyebrow. The history which he gave was as follows: Several years before, masses of polypi had been removed from both sides of the nose, affording him relief from the nasal obstruction of which he had complained. After a time this obstruction again became marked and three months before consulting me he first noticed a discharge from beneath the left eyebrow. There was no history of pain and the trouble had not prevented him from performing his daily work, that of laborer in a steel mill.

Examination revealed a rather pronounced exophthalmos of the left eye, considerable swelling of the soft parts above it and a fistula immediately beneath the center of the eyebrow. Through this fistula there discharged a thin, grayish yellow pus. A probe introduced into the fistula revealed some denuded bone and passed into what was apparently an unusually large frontal sinus. Both nasal fossae were completely filled with polypi. Inasmuch as the patient was otherwise in good health and had experienced no great discomfort from the trouble in question an attempt was made to free the left fossa under cocain anesthesia at the office. Enormous masses of polypi, as well as a portion of the ethmoid labyrinth were removed. It was not possible, however, to remove all of the polypi, on account of the bleeding which obscured the field. The patient returned to his home and was not seen until the third day following the operation, when he reported a fair degree of breathing-space on the left side. The drainage through the nose, however, had not caused any decrease in the swelling above the eye.

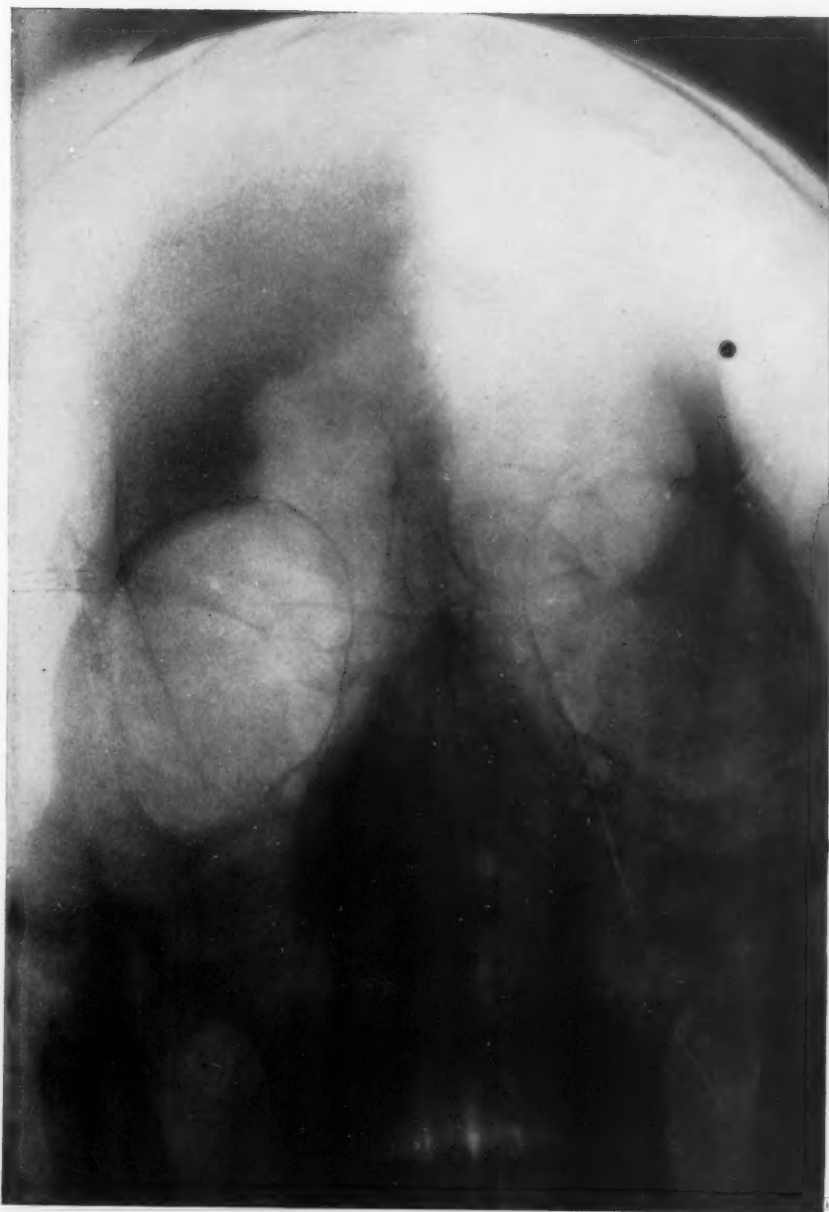
Four days after the first operation he was sent to Lakeside Hospital for operation under general anesthesia. X-ray plates were

*Read at the annual meeting of the American Laryngological, Rhinological and Otological Society, Washington, D. C., May 8, 1913.



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made upon his admission, in both the lateral and antero-posterior planes. These plates gave a distinct shadow extending from the median line to the lateral skull-wall and from the anterior wall to a line passing just anterior to the external auditory meatus, apparently filling most, if not all, of the anterior fossa of the skull.

A Killian operation had been contemplated but, on account of the condition shown in the radiographs, it was decided to open the skull cavity through the frontal sinus and to rely upon the findings as a guide to the operative procedure. A curvilinear incision through the eyebrow was made and carried down to the bone. Skin and periosteum were then reflected upward as far as possible. On removing a portion of the anterior sinus wall, above the inner canthus, a plate of bone was encountered lying free and quite movable.



Figure 1.



Figure 2.

Before operation.

This proved to be the posterior wall of the sinus and was removed as a sequestrum. Masses of tissue resembling the convolutions of the brain immediately bulged through the opening. There was no pulsation, however, while the color was that of the ordinary nasal polyp. To afford greater working space a vertical incision, joining the first incision at right angles, was carried upward for 4 cm. while the anterior cranial wall was resected over an elliptical area 3x5 cm. Not knowing where the dura might be encountered or what its condition would be, the tumor mass was removed very carefully piecemeal with broad blunt forceps. The mass removed appeared to be the ordinary nasal polypi and measured fully one-fourth liter in amount. The only point of origin within the skull-cavity was a pedicle fully one cm. in diameter, and situated at about the center of the internal or median wall. When this was severed there was

some bleeding but this soon stopped without ligation. After the mass had been entirely removed a cavity was disclosed, lined with smooth walls and apparently co-extensive with the anterior fossa of the skull. The forefinger introduced into the cranial opening failed to reach its posterior boundary.

Attention was now directed to the orbital roof, which was removed wherever necrosed bone was discovered. A large-sized curette was then readily passed through what was evidently the fronto-nasal duct and masses of polypi removed from it. After curetting, this passage was about $1\frac{1}{2}$ cm. in diameter and seemed ample for drainage.

On account of the length of the operation, about one and a half hours, and the condition of the patient, which was not very favor-



Figure 3. After operation.

able, it seemed best to reserve any further operative interference for a subsequent time. The wound was therefore packed with gauze and a wick carried through the enlarged fronto-nasal duct into the nose. After the usual outer dressing the patient was returned to the ward in good condition. Recovery, with the exception of delirium tremens, which developed on the second day and continued for forty-eight hours, was uneventful and the patient left the hospital at the end of one week. The eyeground was examined by Dr. W. E. Bruner, who found nothing abnormal. There was apparently no ill effect from the sudden relief of the intra-cranial pressure. Dr. Ruh, the resident pathologist, who examined portions of the mass removed reported them to be mucous polypi.

Up to December 23, the patient reported at the office three times weekly for dressings. The external opening had gradually grown:



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smaller until there was a union of the outer skin with the inner epithelium, leaving a permanent opening about one cm. in diameter. No attempt was made to close this, as the drainage through the nose has not been entirely free. At first gauze was carried through the fronto-nasal opening into the nose, but rubber tubing about $\frac{3}{4}$ cm. was soon substituted for the gauze. On January 1 the patient returned to his work, reporting once a week for dressing and examination, the other dressing being done by his family physician. On December 4 enormous masses of polypi, together with most of the middle turbinate and ethmoid labyrinth had been removed from the right fossa, and on February 1 more polypi and part of the middle turbinate from the left fossa.

The orbital sinus continued to discharge for a time after the patient left the hospital but finally closed and has remained firmly healed up to the present. The patient is now in the best of health and has worked steadily every day. Advantage was taken of an enforced vacation in attempting to render the nasal drainage more free by the use of Sullivan's rasps. This is now fairly free but not sufficiently so that the closure of the external opening can be considered safe. It may indeed be necessary to have him return to the hospital and secure nasal drainage by the typical Killian method. When the nasal drainage is unobstructed the external opening can be easily closed, and no doubt with safety to the patient.

There are several points of interest in regard to the foregoing case. The first is the entire absence of symptoms following the loss or compression of so large a brain mass. There was no history of headache or paralysis while the mentality seemed good. The second is the presence of polypi in this situation. Mucous polypi in the frontal sinus are, of course, common, but their encroachment upon the cranial contents is most unusual. The absence of infection is striking. The third point of interest is the ultimate outcome. Will this cavity fill with granulations and so become obliterated or will it persist? My own belief is that it will remain practically the same size that it is at present. Through the anterior opening a good view has been constantly obtainable by means of a large-sized aural speculum. The walls are smooth and though there has been some pushing forward of the posterior wall this has been too gradual to make the complete obliteration of the cavity seem probable. The distance from the outer surface to the posterior wall, as measured by the probe is now 5 cm., while the distance to the extreme posterior external angle measures 7 cm.

Osborn Building.

A NEW AND EFFICIENT TREATMENT OF ATROPHIC RHINITIS.*

DR. K. K. WHEELLOCK, FORT WAYNE, INDIANA.

I have treated atrophic rhinitis for many years without special benefit to patients except such as follows the use of cleansing solutions and the local application of argyrol. These patients have been only temporarily relieved of the fetor and dried accumulations of mucous. Every one who is familiar with nasal diseases recognizes in atrophic rhinitis a condition which has, so far, baffled the efforts of all men in all climes to cure. I need but quote St. Clair Thomson on prognosis to voice the position of all authorities on the outlook, up to the present time, of the treatment of atrophic rhinitis. He says "Diseases of the Nose and Throat" (Edition, 1912): "This affliction is the opprobrium of rhinology and it would be rash to promise a cure in any well-marked case. At the same time the patient can generally be comforted with the assurance that treatment will remove the offensiveness of the complaint and render her tolerable to her fellows; but the treatment must be kept up indefinitely.

The etiology of atrophic rhinitis is as obscure as the knowledge of the successful treatment has been hitherto unavailing. We may divide the general causes into: (1) structural, such as relate to narrowness and openness of the nostrils; (2) secondary effects of sinus disease; (3) bacterial infection; (4) constitutional syphilis, tuberculosis, atrophic neurosis, etc. Such a diversity in the factors of causation argues a want of knowledge of etiology.

Pathology: The striking result is atrophy of the mucous membrane which becomes merely a covering for the bony framework of the nares and the lines of the turbinates stand out in startling osseous clearness. The ciliated epithelium changes into stratified epithelium; the capillaries and venous spaces are obliterated; the walls of the small vessels are thickened; there is a round-cell infiltration about the mucous glands and the whole structure is changed into dense connective tissue. We have, then, the general atrophy of epithelium, basement membrane, glands and bone as well as lymphoid cells and blood-vessels. No wonder there seems no help.

*Read at the meeting of the Fort Wayne Medical Society, April 1, 1913.

I will not dwell upon the symptoms. Let it suffice to say that in Germany the condition is called "Stinknase;" in France "La punaise." The disease is four times more frequent in women than in men. St. Clair Thomson says "as a rule she has anosmia, but up to the time of the loss of the sense of smell the odor is worse during the catamenial period." Associated with atrophic rhinitis there are ocular disturbances as well as constitutional symptoms which may be both infective and psychical. My cases have markedly improved in physical health. In November, 1912, I began the use of "scarlet red" in the treatment of two cases of atrophic rhinitis which had been under observation for some months without notable improvement. After the continuation of the medicine for two weeks I noted a marked improvement. In the first place the accumulation of the secretion became much less in quantity and the character of the secretion changed markedly. From a heavy dark-brown crust requiring to be removed with forceps it became a mucoid, diffuent collection which could be discharged by blowing. In the second place from a membrane stretched tightly over the bony scrolls and walls of the nares, presenting a shiny dry appearance, the mucous surface became thick and velvety as compared to the former state. The patient began to see an improvement which was manifested by less and less secretion. In these two cases, one a male, Mr. L., the other a female, Miss S., we had the remarkable condition of a large and bulky growth of membrane over the inferior and middle turbinates in marked contrast to the appearance previous to the treatment. The covering before the treatment with "scarlet red" was a thin, pale, dry parchment-like membrane drawn over the turbinates, the nasal walls and vault of the pharynx. The vault of the pharynx could be readily seen through the nares. The membrane seems now not only to have an epithelial covering but also to possess a thick basement layer. It is evidently more vascular. The faucial wall cannot now be seen through the nares owing to the thickened membrane of the turbinates. Under a weak solution of cocain and adrenalin the turbinates shrink and behave as does the normal mucous membrane.

My method of treatment is to remove all crusts by lavage with a warm solution and forceps, dry the membrane with cotton, then apply the salve over every millimeter of the membrane with an applicator wound with cotton. The oro-pharynx is also treated in the same manner. No ill effects have followed the free use of the medicine. At first I made the application twice a week. Now after three months' use I find once in two weeks to be sufficient.

Clinically the cases show marked improvement while symptomatically the patients wish to consider themselves well. The sense of smell has returned and where before, the act of eating was merely perfunctory it is now attended with satisfaction. Both have gained in weight and the chronic indigestion from which Mr. L. suffered has disappeared.

My third case, Miss K., was taken on January 17, and the turbinates are filling out with epithelium, new blood-vessels and probably basement membrane as well. In her case the appearance of the oral fauces is so changed that it would be difficult to say we had an atrophic rhinitis to deal with. Sensation has returned to the nasal mucous membrane. When I first began the treatment of these cases with "scarlet red" the application of the salve to the mucous membrane was attended with no apparent distress, now there is every evidence of acute irritation as is shown by the patient's complaints as well as by lacrimation. It seems, then, that the nerve filaments have also been regenerated.

It may be unnecessary to review the literature of analin and its combinations; so I shall refer the reader, who is interested, to Dr. John Staige Davis' articles published in the *Annals of Surgery*, January, 1910, and May, 1911. Dr. Davis makes reference to sixty cases of granulating sores treated by "scarlet red" and refers to Fisher's first use of it, together with the conclusions which other observers have drawn from its use. I am sure that clinically a new epithelium has been formed in my cases of atrophic rhinitis, a new basement membrane has been formed, new blood-vessels have developed and new nerve-filaments have appeared.

How long the regenerated tissue will remain as now seen, time will determine. My patients have received such marked benefit from the use of "scarlet red" that I cannot but share their enthusiasm and offer this treatment as the best for the relief of these, hitherto, hopeless cases.

1020 Harrison Street.

Syphilis of the Nose and Throat. H. H. MARTIN, *South. Med. Jour.*, Jan., 1913, p. 19.

In this article the initial, secondary manifestations of syphilis, especially in the new-born, are very briefly discussed. As effective therapy the author mentions "black-wash," a mixture of calomel and lime water.

ED.

**THE INFLUENCE OF SOUNDS OF DIFFERENT PITCH,
DURATION AND INTENSITY IN THE PRO-
DUCTION OF AUDITORY FATIGUE.***

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It seems to be a universal law in biology that when any living substance is required to be active a certain length of time the phenomenon of *fatigue* sets in, manifested by a depression of irritability and a lessened capacity for work; if in spite of these symptoms, and the sensation of fatigue which generally accompanies and is intended by nature as a reminder of the evil effects and a warning to desist, the stimulation is continued, the ultimate result is *exhaustion*, marked by complete incapacity for further activity. In the case of voluntary function this is the ultimate stage, because there can be no further activity in an organ which refuses to respond to stimulus.

A muscle that is exhausted cannot be stimulated to further action by an effort of the will. In the case of those functions which receive stimuli involuntarily from the outside world these stimuli might be continued in spite of exhaustion, resulting ultimately in a third and still more advanced stage—viz., *degeneration and destruction*. In the case of the auditory function, we have both clinical and experimental proof of the degeneration of Corti's organ from excessive stimulation.

We have known for a long time not only that sudden very intense noises of the character of violent detonations may produce labyrinthine concussion, but also that certain occupations, such as that of coopers, tin-smiths and boiler-makers, which are attended with constant, loud and disagreeable noises, may produce absolute deafness due to nerve degeneration. Recently, Wittmaack, Marx and Yoshii have made experiments to prove that continuous intense noises are capable of producing degenerative change in Corti's organ, but they have not agreed in their interpretation of these findings with regard to their bearing upon the Helmholtz theory of audition.

Because ordinary fatigue is more easily demonstrated in the muscular fibers than in any other part of the body, physiologists have generally selected this element for their experimental studies of fatigue phenomena. And so, by their painstaking researches, some

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highly interesting facts have been evolved governing the phenomena of fatigue and exhaustion as displayed by muscle. All are agreed at the same time that the nervous system, although eluding the application of the same fine analysis, is no less subject to fatigue than other parts. This, however, is not equally true of all parts, for while nerve fibers are so resistant to fatigue that one author (Wildenskii) goes so far as to assert that they are indefatigable, it is the consensus of opinion that nerve cells fatigue with unusual readiness.

The extreme delicacy of Corti's organ is such that *a priori* fatigue might be expected to result with but slight provocation. The auditory

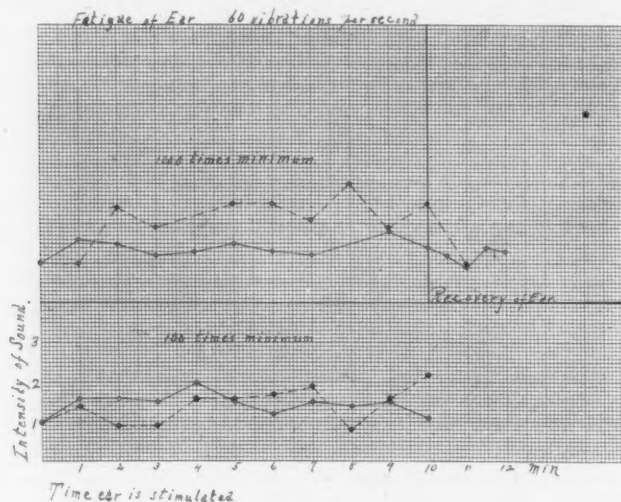


Figure 1.

nerve and papillae are exposed, as no where else in the body, to a liquid which readily varies in its physiological composition and tension. We know, most of us from our personal sensations, how by mere emotional effects we may get a surtension of the labyrinthine fluid that can make us aware of the pulsatile tinnitus from the carotid. The frequency of tinnitus of all kinds is an evidence of the irritability of the cochlear part of the labyrinth, just as the common occurrence of vertigo from slight causes indicates the sensitive nature of the nerve fibers and cells distributed to the semi-circular canals.

As the function of audition is a very complex one, which requires for its perfect operation the concomitant activities of several

kinds, it may be inferred that auditory fatigue is similarly a complex phenomenon, made up of different and diverse factors, the relative importance of which it is indeed a difficult matter to determine.

First of all our thought naturally centers upon that marvelous peripheral organ, situated in the cochlea, where, according to Mueller's law of specific energies of the senses, if not the most important certainly a very essential part of the work is performed. But the delicate mechanism of the middle ear must not be overlooked, for, as a muscular action comes into play in its duty of transmission and delivery of the sound-waves in the most effective manner, fatigue effects here must be expected. And it is especially in muscular action that the phenomena has been observed and demonstrated. That the tensor tympani contracts under the reflex stimulus of sound was shown some time ago by Hensen and Bockendahl, and in this they have been confirmed since by other investigators. Polak found that though sound was conveyed to one ear, a corresponding reflex contraction would also occur in the tensor tympani of the other side. It is noteworthy that his experiments seemed to show that the higher in pitch the sound stimulus, the more marked was the resulting contraction.

The hypothesis seems fairly rational, that it is the special function of this little muscle to bring about different degrees of curvature and tension in the membrana tympani, in response to the impact of vibrations of varying degrees of frequency, so that this membrane might be attuned as it were to respond with a maximal sensitiveness to sounds of different pitch. May we hazard the conjecture, without experimental support, that the stapedius, innervated as we know by an entirely different nerve, responds for its part only to differences in amplitude, contracting with greatest force to sounds of greatest intensity.

From its attachments, we can infer that contraction by pulling on the oval window lessens labyrinthine pressure and by its action upon the ossicular chain brings about relaxation of the drum membrane. These are certainly both protective functions which might have a most useful purpose in case of sounds of excessive intensity. This contraction of the muscles of the face, especially the orbicularis, which accompanies stapedia contraction is very suggestive in this connection.

Another factor which plays a conspicuous role in audition, and which must be seriously reckoned with in the estimation of fatigue of this function, is the faculty of attention. Consciously or uncon-

sciously by the exercise of this faculty we sensibly facilitate the function of hearing in the higher centers producing a state of preparedness and expectation which favors receptivity of the sensorial image. Also there is probably at the same time a drifting centralward of energy, which though it may not increase the intensity of the impression certainly tends to a better definition of the cortical image.

Attention is probably not confined in its influence to the cerebral apparatus, but exerts also a favoring influence upon the muscular mechanism of the middle ear to which we have referred. By increasing the tonus of the muscles, it may have the effect of placing

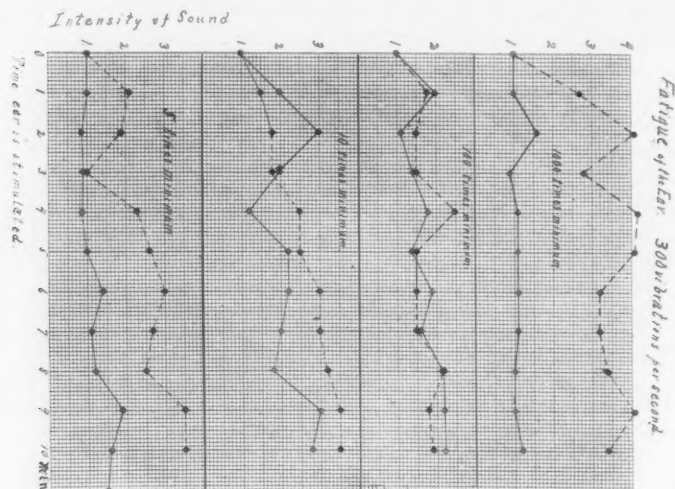


Figure 2.

the articulations and the ossicular chain in the necessary state of elasticity and suspension, which, as Bonnier expresses it, render these in a higher degree susceptible to vibratory solicitations.

To return more directly to our subject, suppose we are able to uncover certain facts and formulate certain laws in regard to auditory fatigue how can this information be of either theoretical or practical value:

Theoretically it has seemed to us that it offers a fruitful field of study of the auditory function. This is a very natural supposition accustomed as we are in medical science to judge what is normal by a study of abnormal manifestations, and to make deductions in regard to functions of an organ by observing its disturbances.

One of the experiments which we instituted, has, as we shall see later, a direct bearing upon the much contested function of the cochlea and tends to confirm the neo-Muellerian theory which applies the law of sense energy to quality as well as modality.

Practically the information derived from a study of auditory fatigue may possibly be utilized in connection with the recently launched propaganda for the suppression of unnecessary noises, as showing under what condition sounds produce injurious effects.

Furthermore such experimental studies might prove of practical value in giving a suggestion or establishing a criterion for the possible utilization of acoustic exercises in the improvement and strengthening of failing audition. So far as our researches in the literature go there have been but few attempts at a systematic study of this important subject of auditory fatigue.

Corradi pointed out that when a tuning-fork, held against the mastoid, ceased to be heard, was removed and after about two seconds interval replaced, the sound-perception was renewed. This might sometimes be repeated once, twice or three times. Hammer-schlag made similar observations with regard to aerial conduction of tuning-fork vibration. Eitelberg observed that some individuals after listening for about forty-five seconds to the sound of a watch, would lose the sound or hear it with less intensity.

Recently Vasylyeff, a Russian Army Surgeon, made experiments upon soldiers with reference to auditory fatigue. He compared a great number of times the duration of the vibration of forks of different pitch in the cases of a number of soldiers with his own, which had in each case been previously determined. He concluded that the law of Du Bois-Reymond, as regards excitability of motor nerves, may be equally true of the end-apparatus of the auditory organ. With regard to difference in pitch he found that fatigue of the auditory nerve with sound-transmission through the air is much greater for high tones than for low.

The chief fault with experiments of this kind is that the instruments employed do not permit of a satisfactory measurement of the sound stimulus. Sensation itself is not actually capable of mensuration so that its power can really only be stated in terms of the energy employed to produce a given sensation. We must, therefore, in estimating fatigue, make use of a source of sound whose intensity can be easily and exactly measured.

The author's experiments were conducted at the Government Bureau of Standards, with the able assistance of Dr. Harvey Curtis, one of the physicists whose expert knowledge of electricity was in-

dispensable in such work. We employed as the source of sound a special machine which furnished an alternating current capable of giving a frequency of from 60 to 3,000 cycles per second. A measured current for this machine is passed through the primary of a variable mutual inductance. An alternating current having a very pure sinusoidal wave-form is thus produced and sent to a specially constructed sensitive telephone. This current may be easily varied and measured.

It is assumed that the intensity of the sound is proportional to the current, though if this intensity be defined as proportional to

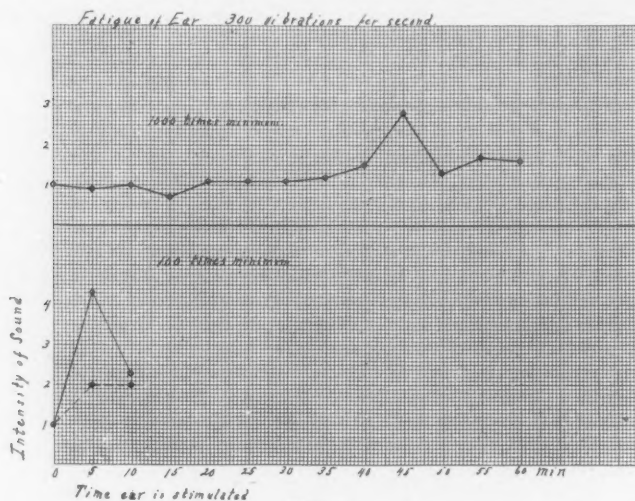


Figure 3.

the square of the amplitude, the intensity is proportional to the square of the current. In this method the fatigue will appear more marked than is shown by the curves.

The method of procedure for the demonstration of auditory fatigue was as follows: We first determined for the subject his threshold of intensity for a given pitch, that is to say, by carefully testing we determined the lowest possible intensity necessary to produce a clearly recognizable sound-sensation of that particular pitch. In testing this for fatigue we would now augment the intensity of this original threshold or liminal value 10, 100 or 1,000 fold, as the case might be, and expose the subject's ear to this multiplied intensity a determined length of time. The hearing would then immediately thereafter again be tested, to discover if the original thresh-

old had been lowered or raised and how much. This process could be repeated any number of times.

The results of the tests are graphically shown in the accompanying charts. They have not been made upon a sufficient number of subjects nor repeated a sufficient number of times to permit us to draw sweeping conclusions, but they were at least suggestive enough to enable us to make a few observations which may be summarized as follows:

In practically every instance by this method we were able to demonstrate a greater or less degree of fatigue, which seemed to

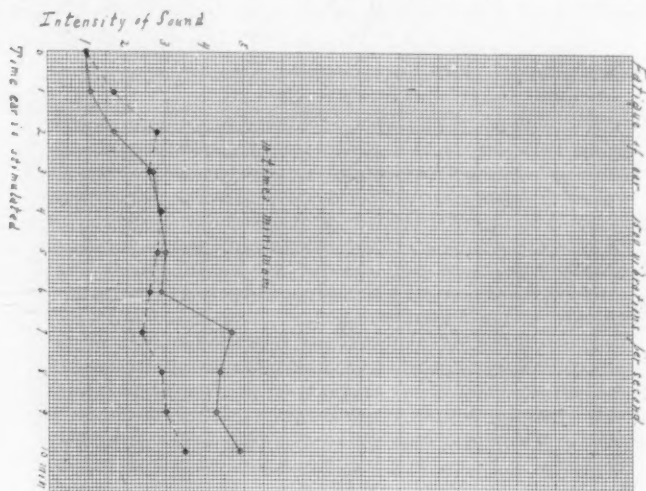


Figure 4.

vary not only with pitch, duration and intensity, but with the general condition of the subject at the time of the test, and especially with the state of his attention or with the disturbing noises even though they were very slight.

With regard to influences of differences in pitch, we found that towards the middle of the range the auditory organ was most resistant, and that it was especially manifest as we approached the two extremities either upward or downward. This is probably due to the fact that the middle zones of the ear are the most practiced and, therefore, the most developed; for we know that though the human ear has a range of about eleven octaves the range of conversation does not extend beyond five and is chiefly comprised within about two or three, extending upward from say 80 to 640 vibrations per

second. Wien, Quix and Zwaardmaker have in fact demonstrated by painstaking tests that we have for the tonal scale a zone of maximal sensitiveness just as we have an area of greatest retinal sensitiveness. This zone has been found by these authors to extend from C¹ to G⁴.

One, at first thought, might suppose that the more sensitive the part, the quicker it would manifest fatigue-phenomena, but such is not the case, its great sensitiveness being rather an evidence of its development into an organ of greater perfection and strength. There is probably in these areas a more rapid recovery than in the less developed parts of the cochlea, in accordance with the observation

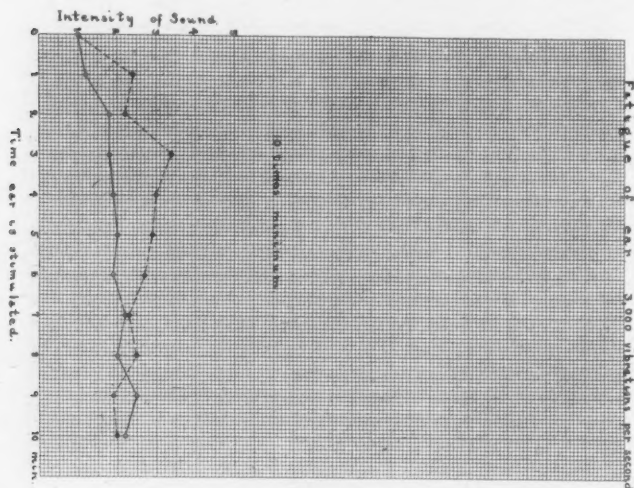


Figure 5.

made by Mateucci that the recovery from fatigue-effects occurs with greatest promptness in cells which show the most marked excitability.

As did Vasilyeff, we noticed that the higher notes were generally more fatiguing than the low. This might be explained by the fact that in the high notes greater number of vibrations must be perceived in a given period. It is quite in accord with the observation that with the same energy a greater psychical intensity is produced by high notes than by low.

Of all the experiments undertaken there was none so apparently conclusively as that done for the purpose of proving whether auditory fatigue for a certain note was restricted to that note or would

be at the same equally manifest for the notes far removed in the scale.

We selected for this experiment notes of the vibratory frequency of 60 and 900 per second respectively. The method consisted in exposing the ear first to one of the notes raised to an intensity of one thousand times its normal liminal value for the duration of a minute, then testing for the threshold value of each, taking them alternately. We found that in either case whether we fatigued on the high and compared with the low, or on the low and compared with the high, that while the liminal value ascended considerably for

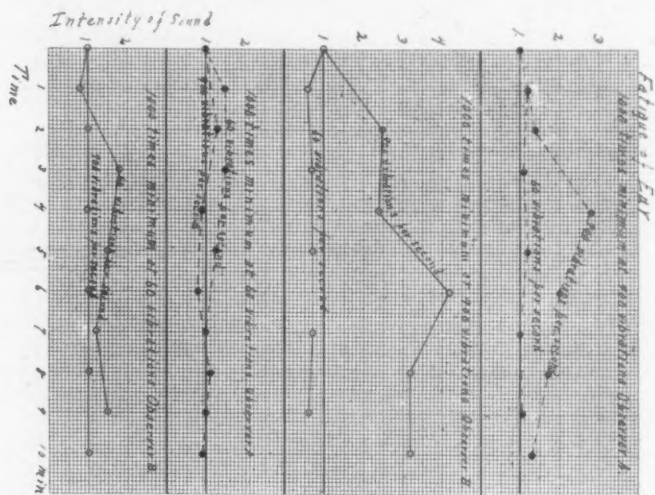


Figure 6.

the fatiguing note, it held normal value for the other. This experiment seems to indicate that separate cochlear areas are concerned with separate notes and bears out the Helmholtz conception of the auditory function.

In order to give a physiologic basis to his theory, Helmholtz, we know, carried the doctrine of specific energy as proposed by Johann Mueller to a point decidedly beyond that in the mind of the propounder. Mueller maintained that every sense-organ, if the stimulus be adequate, responds with a sensation peculiar to that organ. The olfactory organ, no matter how stimulated, can give rise only to sensation of smell, the retina only one of vision, and so on. This is a specialization of function which applies to modality only.

Helmholtz and his followers extended it also to differences in the quality of the sensation, when they maintained that for vision there must be separate nerves and cells for different colors, and in the case of audition separate nerves and cells for vibrations of sound which differ in pitch. Thus was built up his theory of sympathetic resonance, which regards the cochlea as a vast congeries of resonators each attuned to a different vibratory frequency corresponding in number and variety to all the notes within the range of audibility.

As regards intensity we were not able to see any direct ratio between fatigue and the grades of intensities which we used. In the higher intensities with the deep notes a booming sound seemed to linger in the ear as sort of an after-image of which rendered it difficult to ascertain the threshold quickly in such cases. Sounds of low intensity approaching the threshold were especially fatiguing because the factor of attention came here particularly into play.

Finally our experiments, while they demonstrated conclusively the fact of fatigue in the auditory organ, at the same time served to impress us with this organ's wonderful powers of recovery. We found that we required an average of fifteen seconds to pass from a fatiguing sound to zero and thence ascertain the liminal value. Uncertainties in our mind of what we heard would sometimes cause delay and in such case we found that even a few seconds additional decidedly affected the result. We found that where the ear showed a high fatigue-value, that in testing at intervals of fifteen seconds, it gradually fell back and was generally normal in one or two minutes.

Considering how constantly the ear is exposed to sounds not only from without but also to some of intrinsic origin, it must be owing to this wonderful recuperative power that it does not show more frequently evidences of fatigue or even of a degenerative change.

The Rochambeau.

Roentgen Therapy in Otosclerosis. H. ORTLOFF. *Arch. f. Ohrenh., Bd. 90, Heft. 4, 1913, p. 233.*

Contrary to the results reported by Joulin and Schwarz, Ortloff does not find radiotherapy of permanent value in otosclerosis. Occasionally the deafness is ameliorated but this is only temporary. Further experiments are urged.

ED.

THE SUB-PERIOSTEAL TEMPORAL ABSCESS OF OTIC ORIGIN WITHOUT INTRA-OSSEOUS SUPPURATION*.

DR. HENRI LUC, PARIS, FRANCE.

The aim of this short paper is to convey to the knowledge of my American colleagues a special complication of the infection of the middle-ear, the first description of which I published in 1900. Other examples of it have been published since then, either by myself or by some of my colleagues (in Belgium, Vues; in France, Pecharmant, Aboulker, Jacob, Jacques and Gault).

Though our distinguished colleague, Thomas J. Harris, recorded the chief features of my own description in his excellent paper on "Atypical Mastoiditis" read before the meeting of the American Otological Society, Atlantic City, 1911, I thought it might not be totally destitute of interest if I summarized before you the few characteristic symptoms which enable us to recognize this particularly benign complication of middle-ear infection and to apply to it the not less benign treatment it requires; thus sparing our patients the useless opening of the bone.

I wish to record the two cases which by opposite routes gave me the clue to a right interpretation of the accidents in question.

Few otologists, I think, may boast, after some years of surgical practice, of never having opened a perfectly normal mastoid. Such had also been my lot perhaps more than once, when in the spring of 1900 I again failed to find the suspected pus in the mastoid of a young girl presenting such an ensemble of general and local symptoms to make the incident unforgettable.

The girl in question, 9 years of age, had been attacked on April 28, by an *angina a frigore*. Six days later, pain in the right ear, but moderate and not interfering with her sleep. After another lapse of three days, while no discharge had been noted from the ear nor any increase of the pain, there developed a diffuse swelling on the temporal region, moderately tender under pressure and accompanied by a slight edema of the upper eye-lid of the same side.

The family doctor consulted me about the meaning of that swelling. I first directed my attention towards the ear, where I noted

*Read at the meeting of the Ninth International Otological Congress, Boston, Mass., August 14, 1912.

but very slight anatomical and functional modifications; the hearing-power was but little lowered; the tympanic membrane showed some redness, but no bulging, and did not let any discharge escape after being opened. There was no appearance of furuncles in the meatus.

On May 8, the temporal swelling having increased gradually and extending to the mastoid region and as the very distinct fluctuation could not allow any doubt as to the presence of pus under the periosteum, it was decided to open the abscess under chloroform. The incision of the soft parts made along the insertion of the auricle down to the bone confirmed the diagnosis, while letting a teaspoonful of pus of creamy appearance escape.

Being still under the influence of the generally admitted views, namely, that any sub-periosteal suppuration of otic origin means a coexistent intra-nasal suppuration and convinced that my operation would not have been complete had I not opened the mastoid antrum, I removed the cortical of the apophysis on all its extents, unwittingly denuding the sigmoid sinus that was situated abnormally far forward, but not finding any pus in the antrum nor in the region of the apex. Of course the child made a perfect recovery, which though was only obtained after three weeks of dressings.

This case awakened naturally in my mind the desire of avoiding in further similar circumstances, the bony part of the operation which could and ought to have been spared to the young patient with a more precise diagnosis. In consequence of a lucky coincidence, on May 15, while the child, whose case I have just been relating, was still under treatment, I was consulted by a man, 26 years old, for a swelling, the aspect and seat of which offered the greatest similarity to those noted in my first patient: in fact it was more supra- than retro-auricular and occupied a vast triangular surface of the temporal region, with its basis turned upwards, whilst its apex pointed to the soft parts covering the upper wall of its opening. As in the first case, the edema extended to the superior eyelid; there was hardly any fever, the patient's looks were excellent; no spontaneous pain preventing sleep: little tenderness of the swollen parts under pressure.

The patient gave the following history: a fortnight before, in consequence of a cold in the head, he had felt some pain in the other ear (the right one) which had subsided after the appearance of a moderate and transitory discharge from the meatus. Two days later the same symptoms had been noted on the left side. There the discharge only lasted a single day. After a lapse of four days the

swelling had made its first appearance and had not ceased to increase since. As the swelling at the entrance of the meatus made the inspection of the tympanic membrane utterly impossible, I practiced an insufflation of air through the Eustachian tube by means of the catheter, and could detect some crepitus, which suppressed any doubt regarding the infection of the middle ear. On the other hand, the absence of the characteristic tenderness under pressure of the soft parts of the meatus was anything but favorable to the diagnosis of a furuncular eruption.

In order to settle my opinion in that respect, after duly anesthetizing the skin of that region by means of an injection of cocaine, I performed a deep incision down to the bone, along the upper wall of the meatus, in consequence of which I obtained the spontaneous escape of very fluid pus, whose abundance greatly increased by pressing on the temporal swelling. With the help of a probe introduced through the incision I could feel plainly the bony surface denuded.

In spite of the experience acquired at the expense of the previous case I was still so much under the influence of the prevailing ideas that I hardly dared to expect the complete recovery of this second patient from such a limited incision of the soft parts. I resolved, notwithstanding, to stop there temporarily and to apply on the temporo-auricular region a wet dressing, after keeping the incision open by means of a small drain.

On the following day there was still some pus in the sub-periosteal cavity, which was again evacuated by pressure of the temporal region. The inside of the abscess was then touched with a piece of wadding soaked in iodine-glycerin. On May 19 all traces of the swelling had disappeared, and a few days later the little wound had thoroughly healed up.

The two cases I have just recorded were destined to be epoch-making in my practice, since I felt entitled to draw from them the conclusion, that some forms of sub-periosteal suppuration of otic origin can heal in consequence of the simple incision of the soft parts. The question was only to determine with as much precision as possible the clinical features on which such a diagnosis might be founded.

After personally observing some other similar cases and reading the description of several facts published by other authors, I propose to you the following comparative table, as representing the chief elements of differentiation between the sub-periosteal puru-

lent collection consecutive to intra-mastoid suppuration and the sub-periosteal abscess independent on intra-osseous suppuration:

Sub Periosteal abscess accompanying mastoiditis.

Abundant and persistent otorrhea.

Retro-auricular swelling.

Mastoid region tender under pressure.

Deep spontaneous pain with throbbing sensation, preventing sleep.

More or less high fever. Alteration of the face, with an expression of suffering.

Sub-periosteal abscess independent on intra-osseous suppuration.

Slight and transitory otorrhea, having generally disappeared when the swelling occurs.

Rather supra-auricular swelling covering the greatest part of the temporal region and pointing inferiorly towards the upper wall of the meatus, whose soft parts are raised by the infiltration.

Generally little or no tenderness of the mastoid under pressure.

Little or no spontaneous pain. No sleeplessness.

Little or no fever. Good looks preserved.

I am conscious, of course, that such schemas with their appearance of absolutism are very far from corresponding to the essential variability of clinical facts. Their only pretension must then be to be representative of the majority of cases. Of this I cannot give a more illustrious instance than by recording my last case, which was published in the *Annales des Maladies de l'Oreille*, 1903, No. 10, p. 387, the subject of which had his nights disturbed by pains and a rather high degree of fever (38.9°), while the apex of his mastoid showed a marked tenderness under pressure. If, in that case, I did not proceed at once to opening the mastoid, it was only in order to grant a little respite to the young patient and to his parents, all three feeling most apprehensive of the mastoid operation, but I was fairly decided not to delay the mastoidectomy later than the following day in case the serious symptomatic ensemble had not subsided. I, therefore, limited my intervention to drawing the sub-periosteal pus through a long incision performed, under local anesthesia, along the upper wall of the meatus; and great was my surprise as well as my satisfaction, on the following day, on finding the patient fever- and painless, and on noting the complete disappearance of the tenderness of the mastoid apex.

Of all the elements of differential diagnosis previously enumerated I feel bound to propose, as the most reliable, the scantiness and transient character of the otorrhea and the fact that it has generally completely ceased when the temporal swelling first appears. I must also not omit to mention the fact, that, in the only case where the micro-biological examination of the pus of a very typical similar abscess was performed by my friend Jacques (of Nancy), the cultures showed in it the exclusive presence of the pneumococcus. Such an investigation ought to be renewed on all further occasions, since it might provide us with a new means of diagnosis.

The pathogeny of the sub-periosteal temporal abscess I have just

described has been a subject of discussion among otologists. For my own part, I have always considered as the most probable and natural hypothesis, that the infecting germs, after penetrating into the tympanic cavity, pass directly under the mucous membrane of its roof unto the deep coating of the periost of the upper wall of the meatus, finding their natural way from one region to the other through the Rivinus' fissure, along the vascular elements emanating from the deep auricular artery. The absence of any intra-osseous suppuration and the continuity of the swelling all along the upper wall of the meatus and from there to the temporal region seems to retrace exactly the successive land-marks of the microbial migration. I found, furthermore, an unexpected support of this view in an article published by my two colleagues, Le Marc Hadour (of Paris) and Chauveau (of Geneva) in the July number of the *Annales des Maladies de l'Oreille*, under the title: "Periostites du conduit auditif externe au cours des otites suppurees," in which they show the tendency of the infection, in some cases of acute suppuration of the tympanic cavity, especially in children, to penetrate and progress under the periost of the upper wall of the meatus more or less far towards the temporal region.

Whatever may be the views held as to the mechanism of the development of such accidents, there can be no hesitation as regards the best treatment to oppose to them, which, even in the absence of a complete certitude about the integrity of the bone, ought to be first as simple as possible, that is to say, limited to the soft parts, since, in case of an error in that respect, the participation of the bone to the suppuration would soon be revealed to us by the persistence of the local and general symptoms, and we should then have full time to complete our first intervention by extending it to the mastoid cavities.

As regards the seat of the incision, I feel bound to advocate the one I adopted in my various cases: the soft parts covering the upper wall of the meatus, which on all my patients represented the lowest point of the purulent collection. We shall thus realize the best conditions for an uninterrupted escape of the pus, and it is the result of my own experience that, as a rule, patients show themselves less reluctant towards an incision to be dissimulated in the meatus than towards a retro-auricular one. The treatment should be completed by the introduction of a small drain through the opening and by a large and thick wet bandage.

By behaving in the proposed way we shall be conscious of sparing our patients any operative act not absolutely requested; and even if we should be induced later on, by the persistence of the symptoms, to open the bone, they will be much more ready to give us their assent to a more complete operation, since we shall have proved our desire to spare them.

GLIO-SARCOMA OF THE LEFT LOBE OF THE CEREBELLUM, GIVING EXTERNAL SYMPTOMS OF MASTOIDITIS. REPORT OF A CASE.*

DR. JAMES F. MCCAW, WATERTOWN, N. Y.

Mrs. G. O., age, 31 years, seen in consultation September 3, 1912. Family history: Father and mother both living and in good health. One sister living and healthy.

Personal history: Has never been robust and has suffered from sick headaches since early childhood. For several years these attacks have been getting more frequent with increasing severity accompanied by nausea and vomiting, this condition lasting continuously for several days. For six months she has been losing flesh and strength and feels nauseated the greater part of the time, but able to attend to her household duties. Two months ago she contracted a severe head cold which was followed by very sharp earache on the left side which lasted several days, but with no discharge from the canal. This was followed in a few more days by "neuralgic pain" back of the left ear. This pain has continued with only slight intermissions ever since, and for four or five days has been so severe that sleep was impossible except under opiate. Has been very much nauseated and vomiting at short intervals for two days continuously, these attacks being aggravated by the increase in the severity of the paroxysm of pain in the top and left side of head.

With the development of pain over the left mastoid there appeared attacks of vertigo so severe at times as to compel her to take the recumbent position. For the past four days these vertiginous attacks together with the pain, nausea and vomiting had become so frequent and severe that she was compelled to remain in bed. Three days before I saw her there appeared a soft swelling behind the left ear.

Examination: Patient somewhat emaciated, anemic with a very decided sallow complexion and an expression of suffering; the auditory canal clear, membrana tympani lusterless and slightly retracted; hearing good. There was some edema over the entire mastoid region; at the posterior margin at about the location of the emissary vein, there was a smooth fluctuating tumor about an inch in diameter, exquisitely sensitive to pressure. Much manipulation

*Read at the meeting of the American Laryngological, Rhinological and Otological Society, Washington, D. C., May 9, 1913.

of this mass would produce a sensation of nausea. Upon deep pressure there was decided tenderness over the entire mastoid area, the sensitiveness increasing as the fluctuating tumor was approached. There was no evidence of muscular twitchings or paralysis, sensation so far as could be determined was normal, mobility of the eyes perfect and pupillary reaction negative. The eye grounds showed a slightly choked disc in each; and distributed over the fundus of each eye were small, flame-shaped hemorrhages; sight distinctly blurred, the exact degree, however, was not determined. Temperature, 99° F., pulse, 72, respiration, 18.

At this time we could not satisfactorily interpret the symptoms and the objective findings. The writer was convinced, however, that there was some intra-cranial involvement, the nature of which was in doubt from the fact that there was a history of middle-ear trouble two months previously with gradual development of mastoid involvement and the appearance of a fluctuating tumor over the same area. The symptoms, however, were sufficiently urgent to warrant an exploration. She was sent to the hospital and I operated upon her the next morning.

The usual mastoid incision was made and another beginning at about the middle of the original incision and extending downward and backward into the fluctuating tumor above described, which was found to be composed of necrosed tissue, blood-clots and dark grumous fluid blood. The flaps were then elevated, the antrum entered and found normal. The external table of the mastoid was then chiseled away, which revealed an exceedingly pneumatic process, each cell very large, prominently outlined and filled with dark thick blood, the membranous lining of each cell was decidedly thickened and velvety-looking, being infiltrated and colored by the same bloody material. No pus was found. This entire area was curetted away and as the sigmoid sinus was approached it was found exposed by a necrosis of the inner table beginning above the knee and extending downward for about one and a half inches; this necrosis also extended downward and backward from the sinus, exposing a large area of thickened dura. Just below and behind the knee there was a necrotic opening in the dura filled with a firm blood clot, directly connected with the tumor noticed externally. All clots were carefully removed and a sub-dural exploration made which revealed a large bleeding mass. The hemorrhage was so severe that it was thought wise to defer further operative work at this time. The wound was cleansed and packed tightly with iodoform gauze and a compression bandage applied. The patient reacted nicely and next morning said that her head felt clearer than it had for months.

For two days there was a great quantity of 'bloody oozing, so that the dressings had to be reinforced several times. The first dressing was done on the third day and every second day thereafter. At each dressing it was evident that the clot projecting through the dural opening was getting larger and firmer with more resistance below the dura; but as her symptoms were all relieved and she seemed to be making such favorable progress, it was thought wise not to explore further. However, all of her old symptoms began to reappear at the end of three weeks, so that it was impossible for her to retain nourishment.

On September 29 I again operated upon her; this time cutting away the bone below and posterior to the sigmoid thoroughly exposing the cerebellar fossa; the dura which was very thick was freely incised over this area. Terrific hemorrhage ensued and the tumor, $2\frac{1}{2}$ inches by $1\frac{1}{2}$, which I here show you, presented in the dural opening. My finger was quickly passed around it and delivered it from its bed. It occupied the anterior part of the left lobe of the cerebellum. The cavity had to be rapidly packed to control the hemorrhage; so no detailed examination of it could be made. The patient suffered greatly from shock and hemorrhage, but under the usual treatment rallied nicely in about forty-eight hours. All pain, nausea, vomiting and vertigo were relieved by the removal of the growth, but when she left the hospital twenty-eight days later, there was a cerebellar hernia and the evidence of a return of the growth at the anterior part of the wound. This patient went back to her home in Canada and died about two months later.

PATHOLOGIST'S REPORT.

"Examination of fungating growth from behind ear of Mrs. G. O. Portion brought consisted of the fungating part of tumor protruding through skull over lateral cerebellar region. The surface of this mass was full of bone spicules, while deeper parts were markedly hemorrhagic with strands of lighter tissues running through same. Sections were made in different portions of growth. The deeper parts showed structure of glioma with much hemorrhage and zones of inflammation. Towards the surface the cellular elements of bone (osteoblasts and osteoclasts) were abundant and actively proliferating and there were areas, both of new bone-formation and of bone-absorption. On the surface newly-formed bone was abundant with large narrow spaces. No doubt the primary condition was glioma (gliosarcoma) which in fungating through the operation wound sharply stimulated the bone cells to growth, etc.

W. T. CONNELL, Kingston, Ont.

Examination of the original growth gave the same general findings and diagnosis.

Aside from the interest which this case possesses as a brain tumor, there are several unusual features in connection with it which I think should interest us as otologists. Here was a case giving a history of ear-trouble two months before with the gradual development of a mastoid involvement, with all the external symptoms positive, accompanied by unmistakable evidence of intra-cranial pressure and still the findings at the time of operation showed the ear and antrum negative. Such a coincidence in history and symptom-development in a less pronounced case might be very misleading. Such a coincidence of circumstances must be exceedingly rare.

The wide-spread blood extravasation involving all the mastoid cells and the formation of an hematoma below the periosteum resulting from extensive necrosis of both cranial tables, due to the extreme intra-cranial pressure, the source of the bleeding being subdural, which was demonstrated at the first operation when the clot was traced from the sub-periosteal hematoma into the mastoid cells and through the dural opening must be a rather unusual condition.

The position of the tumor in the lower anterior and outer part of the cerebellar fossa, would, I think, in a measure explain the great tendency to bleeding. As the tumor developed it certainly produced increasing pressure on the sigmoid sinus just above the bulb, which no doubt interfered with the return circulation and therefore a factor in the greater tendency to extreme hemorrhage.

When we consider the widespread destructive changes that must have been going on for a long time, it is most surprising that definite symptoms of intra-cranial involvement were not sooner developed.

Bank and Loan Building.

Enucleation of Tonsils and Removal of Adenoids Under Gas Anesthesia. J. F. O'MALLEY. *Brit. Med Jour.*, April 5, 1913, p. 699.

The author employs the Sluder method with slight modifications. Adenoids are removed in about 15 seconds and a tonsil in from 4 to 5 seconds. In addition to the usual preparations for general anesthesia O'Malley administers one day prior to operation and for six days after, a mixture of sodii salicyl, potass. bicarb., potass. chlor. (aa gr. x), elixir aromat B. P. C. (m. xx) and ag. chlorof (fl. oz. jss.).

Ed.

THE USE OF GAUZE PACKING IN THE EAR CANAL.*

DR. MARK D. STEVENSON, AKRON, OHIO.

Small tufts of cotton rolled into a small ball are usually employed in the outer ear-canal when any discharge is present. This serves to protect the ear from the wind, from the entrance of foreign bodies, insects, infections, etc., but instead of readily absorbing the discharges it dams them back into the ear, preventing their free escape. For use in discharging ears, gauze is much to be preferred, making a good protector against external infection and much more readily absorbing the discharges. As soon as the gauze becomes saturated the piece used may be discarded and another piece employed. Gauze has not been used so much for this purpose as cotton because proper-sized sterile pieces of it have not been so readily obtainable. A quantity of the gauze may be secured sterile, but in its use by the patient after opening the package it is very likely to be contaminated by careless handling of the whole, by frequent exposure to dirt, as on a table, by the use of unclean scissors or the storage of proper-sized pieces in an unclean container. Clean scissors are not always available to cut a quantity of gauze into proper-sized pieces.

Realizing the great advantages in securing free drainage from the ear which I pointed out in a paper, "The Use of Cylindrical Gauze and Cotton Drains in Discharging Ears," *Jour. A. M. A.*, January 28, 1911, I had printed instructions prepared as to the proper use of gauze, which I gave to certain patients. However, as it is impossible to have the layman thoroughly understand and carry into effect instructions in regard to exact cleanliness, I have had proper-sized pieces of gauze prepared in quantities so that one at a time can be used without contaminating the remainder. The pieces of gauze consist of strips of selvedge edge gauze about one inch wide and 2 inches long. They are placed in a small paper box container in which paper in a long strip forms the partitions between the separate pieces of gauze. On pulling out the paper, one piece of sterile gauze at a time can be secured.

The following simple directions as to use are placed on or in each package so that any layman can intelligently and safely use them:

*Presented at the seventeenth annual meeting of the American Academy of Ophthalmology and Oto-Laryngology, Niagara Falls, August, 1912.

"This gauze is intended for use in the ear for absorbing discharges. It is intended that as soon as the gauze becomes soiled that the piece shall be destroyed and a new piece employed. This is necessary to preserve sterility and cleanliness of the dressing. The directions should be strictly carried out."

DIRECTIONS.

Always keep the lid of the box closed except when necessary to take out a strip of gauze. Lift only enough paper up to secure one piece of gauze at a time. Never touch the remaining pieces of gauze with the hands, nor permit the entrance of dust, liquids or anything else into the contents of the box. The fingers should be thoroughly cleansed by washing with soap and water before removing or handling the gauze.

The piece of gauze, if possible, should be rolled up and immediately placed as directed by the surgeon. It should never be laid on a table or elsewhere before use.

Short thin pieces of packing with selvedge edges, thus always readily obtainable, may be employed in many ways, e. g., in a nostril, in packing any small wound or by having patients change the dressings by simply changing the gauze and fastening it in place by a little collodion or by adhesive strips. One or several pieces may be used.

165 East Market Street.

Certain Dangers of Adenoid

W. E. GROVE, *Bull. Johns*

Hopkins Hosp., April, 1913.

The two chief dangers Grove classifies as post-operative bleeding of which eleven fatal cases are recorded in the literature, and post-operative infection. Under the latter head the author considers fever, general sepsis, endocarditis, acute rheumatic fever, acute infectious diseases of childhood, tonsillitis, adenitis, torticollis, lung infection and meningitis. In two of his own cases infection of the accessory sinuses followed the operation. Grove felt that this procedure is neither simple nor harmless but should be undertaken in a hospital and the cases watched post-operatively.

ED.

**REPORT OF THE COMMITTEE APPOINTED BY AMERICAN
LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL
SOCIETY TO CONSIDER THE BEST METHODS TO BE
FOLLOWED IN THE TEACHING OF OTO-LARYNG-
OLOGY IN UNDER-GRADUATE AND
POST-GRADUATE SCHOOLS.**

DR. D. J. GIBB WISHART, Toronto; DR. S. MACCUEEN SMITH, Philadelphia;
and DR. CHAS. W. RICHARDSON, Philadelphia.

The subject assigned to our deliberation naturally divides itself into two distinct parts, and yet in the final analysis, the post-graduate teaching is closely dependent upon the thoroughness of the undergraduate work:

THE TEACHING OF OTO-LARYNGOLOGY TO UNDERGRADUATES.

In order to ascertain what methods are followed and what views are held in the various leading universities of this continent upon this question your committee submitted a series of questions to the Professors of Oto-Laryngology in forty of the leading institutions, the list of these being compiled from the Carnegie Foundation Bulletin No. 4, entitled "Medical Education in the United States and Canada."

These questions were as follows: 1. Should the "course of instruction" be extended over one or two years? 2. How many hours should be devoted to this "course of instruction?" 3. What proportion should be clinical and what didactic? 4. In what order should these be given? 5. What should be the limits of such a "course of instruction" having in view the necessities of the general practitioner, and the proper balance of the subjects of a medical curriculum? 6. Should "operations" form part of such a "course of instruction." 7. Should a separate examination in oto-laryngology form an integral part of the final examination?

Replies were obtained from some thirty-one institutions, including over twenty states and provinces, so that the opinion elicited may be considered fairly representative. In perusing these reports, your committee was agreeably surprised to find so little divergence in either practice or opinion as the replies revealed, and has, therefore, the greater confidence in submitting the resolutions which form their conclusions.

We regret that we were unable to elicit satisfactory information as to the amount of "individual instruction" given to each student. Where the number in the classes are considerable, (and if possible that number should never exceed six students), as Mygind points out "the student is apt to acquire superficiality in the examination of the patient;" this fault is undoubtedly in many cases due to the teacher not having sufficient time to take each pupil individually and teach him all the details he should observe."

N. B.—In answering the above questions, which are intended to ascertain the personal views of those responsible for oto-laryngology in the leading medical colleges of the United States and Canada, it is desirable to indicate briefly also to what extent these personal views are carried out in the institutions with which the writer is connected.

We note also that the idea still lingers in the minds of some of our leading instructors, that didactic lectures form an adequate means of instruction. About one-fourth of those reporting asked for equality between didactic and clinical instruction. Surely this cannot be right. The regions involved in oto-laryngology are such as lend themselves least readily to demonstration by lectures, or even by lecture-clinics. It is only in so far as the student receives "individual instruction" on the living subject that he can acquire an adequate knowledge of his subject in the limited time which can be spared in the overcrowded medical curriculum.

This "individual instruction" requires time, patience and competent assistants, but these are well worth the expense involved, as by properly instructing the student of medicine in oto-laryngology we will do much to avoid the conditions which now lead to the foisting of vast numbers of what we may style pseudo-specialists upon the public. To quote Mygind² again "a few cases examined and followed thoroughly teach the student to observe, and give him better experience than a great number of cases examined superficially."

"Individual instruction" as pointed out above demands competent assistant instructors, but the governing boards of our universities must be compelled to realize the absolute necessity which exists for the proper balancing of the medical curriculum, so as to turn out all-round general practitioners and must provide the equipment therefor.

Another point which your committee deem worthy of criticism in dealing with these reports is the scope of the instruction with regard to text-books. Such a course should get as far away from the text-book as possible. We cannot in the least agree with the gentleman who reported in answer to question five, "that the contents of the required text-book on these subjects should be covered, *chiefly by recitations*." (Note the italics). The student should be led to read up the cases he sees in one of the many excellent text-books which are at his command, but to cover a text-book by recitation is simply a waste of time, and must lead to superficiality.

Every student of medicine has a right to be graduated primarily as a general practitioner. The first task of every general practitioner is diagnosis. No amount of text-book recitation will develop the ability to diagnose correctly in oto-laryngology, unless there go beforehand the visual knowledge of the normal as contrasted with the abnormal, the education of the eyes, ears and fingers. This education means actual work upon the patient and the "course of instruction" should therefore be almost wholly clinical.

As regards the order in which instruction should be given, some of the teachers feel strongly that any didactic instruction should be given as the finale, to enable the student to co-ordinate his observations and place them in related groups.

By question five we hoped to elicit a sufficient answer to a difficult problem. With the daily advance of medical science, new subjects are with loud voices demanding admission to an already overburdened course, and even in those universities where the course is one of five

years, it is being found needful to relegate some of the science subjects to the preparatory course, so as to give the student time to digest what he sees daily in the wards.

The best of judgment is, therefore, called for in determining what shall form a part of the minimum curriculum in medicine.

On the other hand as Gradenigo³ has pointed out, "What doctors need in their daily practice should be made compulsory, without expecting them to be familiar with complicated examinations and operations." This states in a nutshell what should be included in the "course of instruction" in oto-laryngology. The student should, therefore, be made thoroughly familiar with the anatomy, be taught the use of the instruments of examination, be able to recognize the normal parts, be familiar with their appearance in the acute inflammations and in the commoner chronic affections, and finally be able to recognize and understand the principles of treatment of the acute affections.

With this information in his possession he will have a solid foundation upon which to build his superstructure, will be able to read his text-book in connection with a given case intelligently, obtain a comprehensive knowledge of the condition of the various organs of his patient, and finally be in a position to secure early and useful assistance from the specialist. Inability to examine a larynx has often led to a failure to recognize malignant disease in its incipient stages, and many examples will occur to all of us, where the lack of training of the student has been to the great suffering of his patient and the disgrace of the practitioner. Such a course will, however, not be complete without instruction from his professor as to what symptoms demand the skill of the specialist, and the unwisdom and criminality of failure to refer the case for examination to the thoroughly trained specialist, when such symptoms arise. The question regarding operations was intended to raise the point that except where emergency aid is required as in myringotomy, intubation and tracheotomy, the general practitioner should not undertake even the removal of tonsils, because every operative procedure in oto-laryngology is attended by risks which call for special training and special skill. The student has a right, however, to understand the way in which the condition of the patient may be improved by skilled operative procedure.

The last question elicited practically unanimous replies that a separate examination conducted by the professor of oto-laryngology should form an integral part of the final examination. The association of a question or two on the ear, or throat, upon the paper in surgery must be relegated to the past.

Your committee, therefore, beg to recommend for your adoption the following as the minimum requirements of the undergraduate course in oto-laryngology:

1. That each student of medicine be entitled to receive sufficient instruction in oto-laryngology to enable him to deal with the parts concerned as intelligently as with the rest of the human body.
2. That for this purpose he should be familiar with the anatomy of the parts, possess a practical working-knowledge of the simpler instruments of examination, be able to recognize familiarly the normal appearance

of the structures, be practically acquainted with the pictures presented by the acute inflammations, and the commoner diseases of the organs involved and how to treat the same. He should further be instructed to recognize the symptoms of serious complications, the wisdom of early associating the greater knowledge of the specialist in the care of his patient, and the dangers associated with all operations upon the parts involved, except in the hands of the competently trained specialist.

3. That for this "course of instruction" a share of each of the two final years of the medical curriculum be essential.

4. That the said "course of instruction" should embrace both clinical and didactic teaching, preferably intermingled, the clinical to be greatly in excess of the didactic, at least in the proportion of three to one.

5. That clinical instruction be given to small groups of students preferably in classes of six, each receiving individual instruction, and this together with the didactic work should extend over a period of at least forty hours in the time of each student in each of the two years.

6. That operations should not form any part of the above course, except that in so far as may be possible each student should be permitted to assist at the performance of the simpler varieties, that he may become practically acquainted with the methods of procedure and the objects sought.

7. That a special separate examination in oto-laryngology, preferably clinical, conducted by the professor of oto-laryngology, form a part of the final examination in medicine of every university, and every licensing body.

8. That a copy of these resolutions be forwarded to the medical faculty of every university and college of medicine, as well as to every state or provincial examining board, in the United States and Canada.

THE TEACHING OF OTO-LARYNGOLOGY TO POST-GRADUATES.

The second part of our report concerns post-graduate instruction in oto-laryngology, and while the former was aimed at the production of the well-rounded general practitioner, this must endeavor to achieve the evolution of the scientific specialist.

The subject is much to the fore on this continent and elsewhere. Last year the *Journal of Laryngology, Rhinology and Otology*, published an able series of articles upon the education of the specialist in throat, nose and ear disease, in Denmark, Germany, Italy, Austria-Hungary and France. In Britain it formed a topic of general discussion at the Liverpool Meeting of the British Medical Association. On this continent, it has led to the publication of recent papers by Schambaugh,⁴ Ellett,⁵ Cragin⁶ and others, and formed the basis of an interesting discussion before this Society two years ago, a discussion which led to the formation of the committee now reporting. A pronouncement by this important organization will therefore be quite apropos at this serious juncture, for we must not forget that with privilege comes responsibility, and this Society, whose membership is so extensive, and whose influence so widespread, should—*noblesse oblige*—lead, not follow, in the making of an intelligent public opinion.

In opening the discussion of the question before the British Medical Association, Mygind⁷ of Copenhagen, stated that: "Although there is no

regular system of education of the specialist in oto-laryngology in Germany or Austria, we may divide the practical education into three stages through which the specialist generally passes both in these two countries and in most other continental countries.

"First stage: the preliminary education which each student receives at the university. It is compulsory in most continental countries, and extends over a period of one term.

"Second stage: represented by the education which many future specialists receive, after having left the university, at one of the numerous post-graduate courses which nearly every university, and many hospitals, offer, and which are given either by professors, or by privat-docents attached to the university. In Austria they are, according to Frey, divided into six different kinds: (A) Clinical diagnosis and treatment. (B) Functional tests. (C) Bedside work. (D) Surgical practice on the cadaver. (E) Practical treatment and minor operations in out-patient department. (F) Demonstrations and lectures on normal and pathological anatomy, histology and physiology, to which quite lately has been added. (G) Pathology and diagnosis of labyrinthine diseases.

"Third stage: the education the future specialist receives as assistant at a special clinic attached generally to a university or to a general hospital.

"The third stage is undoubtedly the backbone of the whole education of the specialist, and it is only a rare exception that a medical man on the continent, nowadays, is universally recognized as a specialist without having been for some time assistant at a public clinic. In Germany and Austria, and also in some other continental countries, so much stress is laid upon this part of the education that one often meets specialists of considerable scientific reputation remaining for a considerable number of years assistants at a special clinic, in order to stand a good chance when a chair in oto-laryngology is vacant at a university. After having been appointed an assistant for a considerable period at a special clinic, and after having given proofs of scientific ability—in Germany an officially approved dissertation must be printed—the specialist may have in Germany, Austria and Italy, the title of privat-docent conferred upon him by the university. This gives him the right of teaching in the university and enrolls him in that high, but no means numerous class of specialists from whom the professors are chosen."

Up to the present, on this continent, there is no recognized portal to the speciality. On the other hand the gates may be said to be many, and yet, *mirabile dictu*, our towns and villages and even our cities are filled with "specialists" who have entered by no gate whatever, but have simply "climbed over the wall" and are to some extent, at least, to be considered merely as "thieves and robbers."

The house-surgeon attached for three months to the oto-laryngological service of a hospital, the general practitioner who derives his knowledge of the subject from a six weeks' course in a post-graduate school, and the man who takes a run to Europe immediately after graduation, alike think themselves worthy to be ranked as specialists.

As long ago as 1892, Osler⁸ pointed out that there is "serious danger in the attempt to manufacture rapidly a highly complex structure from ill-seasoned material."

As Schambaugh⁹ says: "There is a deplorable lack of proper standards in medical education, and the specialities of the eye, ear, nose and throat have had to carry a disproportionate share of these ill-trained practitioners."

Again as Amberg¹⁰ so clearly puts it: "From the standpoint of a well regulated and governed community, it represents anarchy, and anarchy is the absence of government, the state of society in which there is no supreme power."

It is time we had done with this farcical sort of preparation, if our specialty, worthy as it is of the best, is not to be dragged in the mire as a result of the ignorance of anatomy, diagnosis, and technic displayed by a very large proportion of the rank and file of those who now style themselves "specialists in diseases of the ear, nose and throat."

We all know the facts, and we deplore them. Now what can be done to face and overcome the difficulties of the situation? We must first decide what constitutes the standard of proper training, then provide for its acquirement, and finally bring such influence to bear upon state legislatures as to secure the legal enactment that only specialists provided with this training may practice as such.

Those who have written upon this subject are agreed that not less than two years should be devoted to preparation for practice as a specialist, this should, however, be preceded by one or more years spent in general practice, or better as house-man in the medical and surgical services of a good hospital, at least half the time being devoted to surgery. The specialist course itself must embrace highly specialized studies in the anatomy, physiology, embryology, pathology, physics and therapeutics, which bear upon the subject, operations on the cadaver, etc.

The time required for this course will occupy at least six months. In addition the candidates must subsequently serve as resident assistants in a special hospital or in a similar position in the special service of a large general hospital, for a period of not less than eighteen months, and to provide sufficiency of experience the special clinic should work daily and should have at least fifteen beds assigned to its use. In this connection it is well to insist that during the last six months of his service, the candidate shall act as a senior assistant in the major operations, and personally perform those less important.

Where shall such training be provided? Without doubt the scientific part must be placed solely under the control of the universities, for these are the proper bodies to provide post-graduate instruction. In as much as the universities are amenable to the public opinion of such bodies as our own, and as they stand for increasingly higher ideals, there is a guarantee that the instruction provided would be thoroughly scientific and comprehensive.

Not every university could at present undertake such post-graduate instruction, but a few judiciously selected centers could be found even now, where such courses as we suggest could be given.

With regard to the hospital training of the candidates we are not so limited. Several first-class special hospitals exist, whose housemen are in demand by institutions which cannot now train their specialist juniors. The terms of services in these special hospitals are, so far as we know, never less than eighteen months.

In the special services of the larger general hospitals it is becoming increasingly common for the house surgeon in oto-laryngology to be obliged to serve for eighteen months, to confine himself to these subjects only, and to be selected from applicants who have been several years out of college and who have decided to devote their future to oto-laryngology.

It would not be difficult to draw up a schedule of the requirements which such institutions must fulfill if their certificates of services rendered are to count in the qualifying of candidates.

It would not be necessary to confine the candidate to such positions as he could find on this continent, and in any event there might easily be arranged provision for the candidate pursuing further study in Europe.

To add a fitting coping stone to the structure whose erection we are considering, the candidate should finally be compelled to present himself to one of the universities supplying the post-graduate instruction indicated above for examination on the work embraced in the entire course, and the successful candidate should be given a degree—that of Ph. D. (oto-laryngology) has been suggested in various quarters.

In sketching the above course we have drawn nothing fanciful, for at the present time every man who is desirous of placing himself at the top of the ladder in our specialty, in one way or another pursues such a course of study, but often finds with regret that he has not been wisely advised in his choice of work and places to work in, and there is no arrangement for the examination anywhere, except that indicated in the above quotation from Mygind, viz. in Germany.

The final step, that of securing legislative measures, would of necessity be difficult to attain, but public opinion will ere long demand that we be protected from the incompetent specialist, as we are now from the ill-trained dentist.

The program sketched above takes no account of the post-graduate school as at present organized, nor need it do so. The case against the present condition in post-graduate teaching has been ably stated by Birkett,¹¹ and need not be repeated here.

By no reconstruction which we know could we hope to secure any control of institutions which are simply after all incorporated for the purpose of dividends. They came into existence to fill a need produced by the poor character of the instruction in general medicine given by many of the schools of medicine, many of which were themselves proprietary, and as Schambaugh has already said: "when the undergraduate instruction in medicine has been thoroughly done, the elementary work in the specialties will not require the subsequent patching, which is all that the existing post-graduate school are prepared to do." The Carnegie report has already effected a marvelous change

through the public opinion its revelations have aroused, and the proprietary school is doomed.

With regard to post-graduate teaching in oto-laryngology your committee beg to recommend.

1. That the time has arrived to standardize the degree of scientific attainment, and of clinical training, which shall qualify those who wish to begin the practice of oto-laryngology as a specialty.

2. That the report of this committee now submitted forms a suitable basis for such a standardization.

3. That a committee representing this Society be appointed to work out the details.

4. That the other important associations of oto-laryngologists on this continent, viz: The American Laryngological Society, The American Otological Society, The American Medical Association and the American Academy of Ophthalmology and Oto-Laryngology, be and are hereby invited to appoint representatives to act with the above-named committee from this Society, so that the action finally taken shall represent to the fullest extent the consensus of opinion of American and Canadian oto-laryngology.

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Diathermia in Treatment of Deafness from Middle-ear Disease.

HAMM, *Deut. med. Wchnschr.*, July 10, 1913.

Otothermia is of great value in the therapy of chronic diseases of the drum membrane and chronic, non-suppurative middle-ear catarrh; it is effective in combatting defective hearing following middle-ear suppuration, even when operative interference is necessary; in some cases of otosclerosis simple or combined otothermia produced improvement.

Ed.

SOCIETY PROCEEDINGS.
NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, March 26, 1913.

JOHN F. MCCOY, CHAIRMAN.

Fibro-myxoma of the Naso-pharynx. (Presentation of Specimen.) DR.
GERHARD H. COCKS.

The term true fibroma of the naso-pharynx is applied to tumors whose point of origin is in the naso-pharynx, in contra-distinction to false fibromyxomata, which originate in the nose by a pedicle and fall back into the naso-pharynx as they increase in size.

This tumor is a pedunculated growth of the fibromatous type. Its point of origin was a pedicle growing from the anterior cushion of the right Eustachian tube. The dimensions of the growth are:—length, $1\frac{1}{2}$ inches; height, $1\frac{1}{8}$ inches; thickness, $\frac{3}{4}$ of an inch. It is irregular in outline.

The history of the patient is as follows: Mrs. A. M., 23 years old, came to my office on January 7, 1913, complaining of obstructed nasal breathing and a peculiar nasal twang to the voice for the past ten or twelve years. Since last summer her symptoms became worse.

The left nostril was completely blocked during both inspiration and expiration. The right nostril was only obstructed when breathing out through the nose. She has been subject to colds, sore throat, and stiff neck, especially last winter. She has also suffered from headache across the bridge of the nose, and in the occipital region. These headaches disappeared after operation.

Anterior rhinoscopy disclosed a post-nasal mass, visible through the left nostril. With the post-nasal mirror, the tumor could be seen completely filling the post-nasal space. The outline of the tumor was smooth and round. To the examining finger it felt firm (like a fibroma).

On January 9, 1913, the growth was removed under cocain anesthesia, though with considerable difficulty. Repeated unsuccessful attempts were made to extract the tumor by passing a snare through the left nostril with the finger in the patient's mouth. I finally succeeded, with the finger introduced through the mouth, in pressing the tumor firmly against the roof of the naso-pharynx, where it was grasped with a Brandegee forceps and removed with but slight bleeding. The difficulty in removing the tumor through the mouth was due to the ease with which it slipped about in the naso-pharynx. As soon as the finger or instrument was introduced through the mouth into the post-nasal space, the tumor moved forward into the choanal openings, partly filling them, thus allowing the Brandegee forceps to pass upward behind the growth toward the roof of the naso-pharynx.

The unusual features in connection with this case are: (1) the point of origin of the tumor; (2) the scant hemorrhage experienced when the tumor was removed; (3) the difficulty experienced in extracting the growth.

DISCUSSION.

DR. SMITH said that from the appearance of the growth and the constriction around its pedicle one might reasonably conclude it would have disappeared by the fibrous constriction around the pedicle shutting off the blood-supply to the tumor; that these fibromata springing from the naso-pharynx were a very much more serious proposition than those arising in the nose and extending into the naso-pharynx; those which originated in the nose were more polypoid in character, are bottle-shaped and are usually attached by a pedicle in the neighborhood of the middle turbinate. This class can be very easily removed with the snare. He then exhibited a picture of one which he had recently removed from the nose of a little girl. In this case the fibrous elements were more extensive in the extremity of the tumor than in its attachment. In inoperable cases of naso-fibromata the subcutaneous injection of monochloroacetic acid beginning with 2 minims and running up to 5 minims, injected at varying intervals would occasion the disappearance of the fibromata. He had employed this method in three cases with uniform success and was acquainted with other instances where it had been equally effective.

Dr. Smith, in replying to Dr. Quinlan's criticism said that the sloughing took place within the tumor and not upon its surface and that no harm had ever resulted from the injection of these tumors. It was a greater danger to the Eustachian tube to operate as extensively as the fibromata required than to create the small amount of sloughing incident to the hypodermic injection of monochloroacetic acid.

DR. QUINLAN asked Dr. Smith if the injection of the monochloroacetic acid brings on superficial sloughing or deep contraction, and on receiving an affirmative reply, said that he was inclined to consider it an unsurgical procedure to remove a growth in that way in the naso-pharynx and to allow the sloughing mass to remain in contact with the Eustachian tube, as it would seem to be a direct menace to the accessory cavities and middle-ear. He would very much prefer excision for the removal of any such masses. Any material which produces a slough is liable to be disastrous sooner or later, and might develop all kinds of trouble in this vicinity.

DR. YANKAUER said that it would seem that some assistance might have been obtained in getting the snare around the growth by using the naso-pharyngeal speculum.

Another method is that employed by Dr. Beck in his adenoid operations. It consists of putting a rubber tube or cord through the nose, bringing the ends out of the mouth and drawing up the ends. This elevates the palate so that most of the naso-pharynx is brought into view. It must be done under general anesthesia.

DR. GLOGAU said that Dr. Cocks had mentioned the difficulty in removing the growth, and cited a case in which the patient was very sensitive and the growth was removed by means of an adenoid curette.

DR. CARTER asked whether Dr. Smith would advise the use of monochloracetic acid in the case reported by Dr. Cocks. Dr. Smith said that it was not necessary to employ it in a pedunculated tumor which could be removed by a snare or the galvano-cautery. The time required for shrinkage by monochloracetic acid and the slow disappearance of the tumor justifies its employment only in inoperable cases.

DR. MACPHERSON said that a few years ago, acting on the suggestion of Dr. Jonathan Wright, and using Dr. Smith's syringe, he had treated two cases with monochloracetic acid. There was no external sloughing of the tumors, but they gradually contracted and disappeared without recurrence so far as he knew. The method was preferable to the use of the snare or forceps, as by their use the field of operation was dirty and the growths recurred.

DR. MACKENY told of two cases under his care which he had so treated at Dr. Smith's suggestion. The cases were absolutely inoperable. No sloughing appeared, but the part turned white under the point of injection. Both cases resulted very satisfactorily, and there was no ill effect from the use of the monochloracetic acid.

DR. MYLES said that in recent years he had not seen many cases of those enormous fibromata and angio-fibromata of the rhino-pharynx which were formerly seen so frequently. Such cases had proved very difficult to treat. In certain cases he and the associated general surgeons had been accustomed to split the soft palate to gain access to the tumor. In other cases they had removed a part of the antrum wall and malar bone. The hemorrhage was frequently very excessive. All of these cases have a tendency to disappear after the age of 22 or 23, but while the growth by pressure is destroying the parts and causing great distress, he would be inclined to try this treatment, if nothing better can be done.

Closed Empyema of Ethmoidal Labyrinth Unrecognized for Several Years.

Due to Closure of Anterior Naris. DR. WOLFF FREUDENTHAL.

The patient, a middle-aged woman, applied for treatment several years ago, suffering with a sort of eczema at the introitus of the nose. The right naris was almost blocked by a peculiar eruption, which was accompanied by a watery discharge. There was considerable doubt as to what the condition was; Wassermann was negative, and examination of the tissue by the microscope revealed nothing. The mucous membrane was curetted and cauterized, but the condition always returned. There was some hardening of the ala nasi, which suggested rhinoscleroma, but examination for this also proved negative. Several dermatologists were consulted, but no one could give any clue to what the condition was. This continued for more than two years. One day the patient came in complaining of severe headache, and some edema over the right eye. She had never complained in that way before. An x-ray picture was taken, which showed a shadow over the right frontal sinus and ethmoid region. The next day this was operated upon and granulations were found in the frontal sinus, but no pus. When the ethmoid cells were opened a quantity of foul-smelling pus was evacuated, and it was evident that the condition was a closed empyema which had probably existed for many years. There was no indication of affection of any of the other sinuses and the

external wound was closed. The case went on very well for a while and the patient was about to be discharged when she suddenly developed erysipelas. Every precaution had been observed, there had been no case of erysipelas in the hospital for several years, and the appearance of the erysipelas could not be explained. The patient finally recovered entirely, and a few weeks ago was presented with some other cases before a private society, with the statement that this attack of erysipelas could not be accounted for. A dermatologist happened to be present who had previously treated her for a folliculitis of the hands, which was infectious, and it came out that she was not very careful in her personal habits and wiped her nose with her hand. When the sinus was opened up this infectious folliculitis was conveyed to the wound and spread, the erysipelas continuing for five or six days. After that she went home, but returned to the hospital within two weeks. The same folliculitis was all over her face now, having spread from one side to the other. Drainage has been instituted from below and the wound will probably heal completely in a short time.

In reply to a query as to whether there was not an opening in the right nostril, Dr. Freudenthal said that there was a better one than there had been before.

DISCUSSION.

Dr. MACKENTY asked if the patient had been put upon specific treatment. In spite of the fact that the Wassermann was negative, the case looked very suspicious of specific disease. Then again, might not the folliculitis of the nose be due to the chronic sinusitis. He also asked whether Dr. Freudenthal knew at the beginning that there was any sinusitis, or whether that question came up after the folliculitis of the nose.

Dr. MCCOY asked whether Dr. Freudenthal thought that the pus at present in the lower end of the external wound was the result of the folliculitis infection or was from the frontal sinus.

Dr. FREUDENTHAL replied that he thought it was a new infection.

Dr. MCCOY then asked whether the wound had at any time returned to a normal condition after the erysipelas.

Dr. FREUDENTHAL, replying to Dr. MacKenty, said that although the Wassermann test was negative the patient had received large doses of K. I., with absolutely no effect. It was difficult now to say whether the empyema or the folliculitis were there first, but that he did not think the folliculitis was due to the empyema for there was no discharge and no pus had been seen. He had never seen nor heard of any such case before and thought it probable that the folliculitis was there first.

Replying to the question as to whether the pus in the lower part of the wound was the result of infection, Dr. Freudenthal said that the wound had healed very nicely, like any normal wound; it was completely closed and the woman was about to be discharged, but as soon as the erysipelas set in pus was seen again. He thought that it was due to a new infection. The wound was opened from the outside and the pus soon disappeared, but since then the healing had proceeded slowly.

The patient will probably have to be removed from the home environment and placed in more hygienic surroundings before the folliculitis will be permanently cured.

Dr. McCoy said that he had seen cases where a small portion of membrane had been left in the frontal sinus which kept up the suppuration for several months, so that eventually granulations would spring up and close off drainage from the sinus until some relapse occurred and the external wound reopened. He thought that possibly this reinfection was from the outside.

Dr. FREUDENTHAL said that the case was very clear to him. The condition set in after the erysipelas.

Case of Laryngeal Growth. By Dr. S. W. THURBER.

Dr. Thurber apologized for the title of the case, saying it was apparently a growth when the title was sent in for the meeting but conditions had changed during the month that had intervened.

The patient was a painter, 43 years of age, with a negative family history. He had small-pox when 18 months old and this had left considerable pitting. There is no specific history and he had never suffered from poisoning due to his occupation. Five years ago during a cold, he became hoarse; this condition continued five weeks, when his voice came back to normal. The present attack came on six months ago and the hoarseness had continued up to the present time with no improvement. On examining his nose one sees a perforation of the septum with cicatricial adhesions to the right turbinate. The interior of the nose is rather dry but shows no pus or polyp. Transillumination shows small sinuses.

On examining the larynx, the view was partially cut off by a rounded projection from the posterior wall of the lower pharynx on the left side. This was inflamed and tender. In the larynx a sac-like mass was seen projecting over the right true cord and occluding sufficient glottic space to cause slight dyspnea. It was this latter condition that was taken to be a growth at the time he was first seen.

Under no treatment other than steam and tincture of benzoin inhalations, his pharyngeal and laryngeal lesions have about disappeared. The prominence on the left side of the posterior pharyngeal wall was probably an area of infection from some abrasion and the laryngeal condition an edema or a prolapse of the ventricle but, strange to say, on the opposite side. All that can now be seen in the larynx is a bluish sac lying along the right vocal cord and about one-third as wide as the cord. It is questionable whether this is a prolapse of the ventricle or edema of the edge of the false cord. Dr. Thurber said he had seen but one case which he would really consider a prolapse of the ventricle and he was sceptical as to the frequency of the occurrence of a true prolapse. Were these cases not more often localized edema of the false cord? The man's voice now is quite clear.

DISCUSSION.

Dr. MYLES expressed the opinion that it might be a pseudo-prolapse of the ventricle. Not long since he had under observation a patient with an enormous prolapse. It projected as a soft, edematous, rounded mass. He suspected a specific origin, although there was no such history. The Wassermann test was positive, but five injections of neo-salvarsan caused the condition to disappear entirely.

Dr. Quinlan asked the nature of the treatment, to which Dr. Myles replied that it consisted of steam inhalations of benzoin, eucalyptol, acid carbollic and turpentine.

DR. QUINLAN said that it seemed to him like a condition of chronic laryngitis. The man may have more or less faulty resonance, as there was an effort to introduce a certain element of compensation. He thought that astringent applications to the larynx would tend to diminish the congestion and probably reduce the so-called growth. The man's voice was fairly good, and he seems to present the picture usually seen in cases of chronic laryngitis. There was some thickening of the arytenoids and they did not come together with the snap that they should. It might probably be the result of a dyscrasia or some condition of diabetes or struma, or perhaps rheumatism or some other underlying condition. He suggested the application of nitrate of silver or argyrol, which he had seen act admirably in similar cases.

DR. MCCOY said that he had seen several cases of prolapse of the ventricle. The patients had usually been pronouncedly alcoholic and had been using their voices very rigorously. He had three or four cases of this type where a diagnosis of prolapsed ventricle was made, and by cutting off the alcohol and treating the larynx with nitrate of silver the prolapse cleared up quickly and the ventricle was quite clearly seen.

DR. THURBER said that he had been rather disappointed at presenting the case in its present condition, and had tried to maintain the condition as when first seen, for it was very curious and was more like a prolapse of the ventricle than anything he had seen. He thought there was a direct connection between the inflammation of the posterior pharyngeal wall and the laryngeal lesion, and also a connection between the nasal condition and that of the larynx, predisposing to acute attacks of a chronically inflamed laryngeal mucous membrane.

Tuberculous Granuloma of Nasal Septum With Lupus of the External Nose. DR. J. H. GUENTZER.

The patient was an Italian girl, 17 years of age, a factory worker, who had been in this country for five months. On February 18, 1913, she came to the clinic at the Manhattan Eye, Ear and Throat Hospital, complaining of nasal obstruction. Family history was negative, no member of the family having had any similar trouble or skin lesions. She had had no illness until the onset of the present trouble five years ago, which began with a cold, soon followed by the development of tumors circumscribed about the neck. They have appeared at varying intervals, the last one beginning under the chin about five months ago. These abscesses discharged creamy pus, but responded to treatment after a few weeks. A year ago small red papules appeared on the left cheek and left side of the nose which were treated locally in an Italian hospital. The patient came to this country about five months ago, and about that time, along with the submental abscess small papules appeared on the left side of the nose, spreading over to the right side and also into the left nasal cavity. The poor nasal breathing dates back about a year and is worse at night.

On examination of the nose the above described local conditions were found, along with much intra-nasal thickening of the septal tissue. The

mucous membrane was pale. At first the condition was thought to resemble scleroma. The Noguchi-Wassermann test was negative. A piece was removed from the left septal side for examination and was returned from the laboratory with the diagnosis of tubercular granuloma. Von Pirquet test was positive.

One week ago the patient was sent to Bellevue Hospital for treatment under government supervision by Dr. Friedman, and received his injection, which was partly intravenous and partly muscular, and while not therapeutically too optimistic, as far as the external lesion is concerned, it seems to be improved. To-morrow she will go down again and be kept under supervision.

The report of the lung examination showed a few fine crepitations over the left apex; otherwise negative. The patient will be kept under observation, and further developments will be reported.

DISCUSSION.

Dr. McCoy said that he had reported a somewhat similar case before the Section a year before, though the trouble was not quite as extensive. The patient had a lupus lesion on the nose, a typical granuloma in the nose and marked thickening of the septum. She was sent to the Skin Department of the Clinic for treatment of the external condition, where the x-ray was applied. She returned to him three months later and to his very great pleasure, the intra-nasal condition had very markedly improved. The granuloma had almost disappeared and the septum was brought down to almost its normal condition. She has been kept under observation for over a year, and is now almost well.

In a conversation with Dr. Gallaher of Denver, last summer, he mentioned one of his patients, a very beautiful girl, who broke out with a sort of granuloma and was threatened with being badly scarred. He said that he had not tried x-ray treatment, but had tried a tuberculin which he had received from Switzerland. She was markedly improved and he was very well pleased with the result. It might be, therefore, that the tuberculin treatment in this case would give a similar result.

Dr. MacKenty said that he had seen Dr. Guentzer's case when the patient first came to the hospital, and he thought the angry appearance of the granuloma was much diminished; there was also less swelling and less redness. The condition seemed decidedly less active than before the injection.

Dr. Quinlan said that he wished to emphasize the importance of x-ray treatment in these cases. Some years ago he had visited Dr. Finsen's clinic in Copenhagen, where he treated some twelve or fifteen patients in the afternoon. Many of the men said that in these lupoid conditions they did not get the results they desired, and were not satisfied with it. A short time afterward he saw Dr. Schwartz, who was treating ten cases of lupus of the mouth and nostrils by x-ray, and in the eight weeks he spent there he was amazed to see the apparent clearing up of these conditions, and the great improvement in the appearance of the skin. The lesions seemed to absolutely melt away under the x-ray treatment. It is a very valuable adjunctive treatment in this particular class of cases. He had watched these cases very carefully, for he had seen similar ones fail un-

der the Flinsen treatment. The x-ray has some influence which nothing else possesses. He desired to endorse heartily what Dr. McCoy had said regarding the use of the x-ray in such conditions.

DR. CARTER said that he also had seen this case when it first came to the dispensary, and he is certain that the aspect of the case has changed considerably for the better since the Friedmann treatment began.

Removal of a Dime From the Larynx After Eighteen Months By Direct Laryngoscopy. DR. JOHN E. MACKENTY.

The patient, aged 24, while performing tricks in September, 1911, had put a dime in his mouth, which slipped down the throat and lodged below the third cartilage. A doctor was consulted, who said he could see the coin and had pushed it down into the stomach. The patient was given apo-morphin to make him vomit it, but he experienced no relief. For three weeks he could not speak above a whisper and could not swallow even water. He was fed with a stomach tube, and lived in that way for two months. At no time did he have any cough, but talking caused vomiting and nausea. This symptom disappeared, and only the lack of voice troubled him. This continued for twelve months, when he began to have attacks of acute dyspnea, which would compel him to get out of bed and hold on to the furniture in order to get his breath. He seldom coughed, but when he did it was violent and accompanied by bleeding from the mouth and profuse expectoration. He came to the Manhattan Clinic about two weeks ago. At that time he had no voice above a whisper, but no cough and no pain. Dr. MacKenty said that he suspected that the coin had something to do with the condition, so had an x-ray picture made, which showed the coin lying in the larynx between the cords. It was easily removed, though it was fairly embedded in the larynx. The patient's voice was improving steadily and the laryngeal opening is growing less.

Dr. MacKenty said that this was the first case reported of a foreign body remaining so long in the larynx and he wished to know what the members thought of the probability of the ultimate recovery of the voice.

DISCUSSION.

DR. YANKAUER said that he had never seen a case of foreign body in the larynx which had remained for anything like such a length of time, and it was interesting to know that the larynx was not much disorganized. In his experience with foreign bodies in the bronchi, they had produced pronounced local lesions at the site of the foreign body. These cases, however, had all recovered very quickly and completely after the removal of the foreign body. He would expect the voice to return ultimately to its normal condition.

DR. SMITH said that he had seen the case prior to any instrumentation and the false cords were granular and fibrous and grew over the top of the coin. He believed that the removal of the irritating cause would probably result in the reduction of the fibrosis. The man's voice was very much better now than when he heard it a week previously. He believed that it was questionable as to whether the true cord would ever be restored, but that when the functioning properties of the larynx were restored he thought there would be sufficient effort on the part of

nature to utilize the remains of the true cords and part of the false cords to make an articulate voice. He had seen a picture of a similar case in some of the English books where the coin had lodged in the anterior commissure and had been covered almost entirely by the false cords.

DR. MACPHERSON said that he had seen a case where the foreign body, an intubation tube, had remained for more than a year, and the patient never completely regained control of the voice.

DR. MCCOY said that he was surprised at the small amount of disturbance in the larynx produced by the coin. He himself had a case in a youngster who had swallowed an overcoat button which remained in the esophagus for about ten days before he saw him. In extracting it, he was much surprised at the amount of granulation tissue which had formed around the button. The button could not be seen without pushing the tissue aside. All that can be seen now in Dr. MacKenty's case is a little granular thickening in the left ventricle.

In the case of another youngster who had swallowed a seed, there was a tremendous edema of the larynx, and he had been sent for to pass a direct tube and try to remove the mass, but before he could reach the hospital a tracheotomy had been performed. He passed his finger up through the tracheal opening quickly and easily removed the foreign body. The child's larynx was so badly swollen that they had to resort to tracheotomy to enable him to breathe, and yet in a very short time the edema and swelling cleared up entirely.

DR. THURBER told of two charts in the Lefferts Museum at the College of Physicians and Surgeons showing a dime in the exact location as the one in the case under discussion and a second chart picturing a brass ring in the larynx which had been there three years before removal.

He would like to know how it was that in the case presented by Dr. MacKenty a foreign body could remain in this man's larynx for eighteen months without its being either seen or removed.

DR. LYNAH thought it probable that the voice would return to its normal condition. He had presented some cured cases of stenosis of the larynx last year before this Section in which the patients had worn tubes for varying lengths of time—one of the little girls for five years—yet there was practically normal voice.

DR. McCULLAGH said that he had had the privilege of seeing the case before any surgical procedure was undertaken, and the most surprising feature was the comparative degree of comfort which the patient had with the very small air space—he seemed to have no interference with his breathing. The cases of the intubation tubes and this coin case are not similar, although both are foreign bodies in the larynx. This foreign body did not exert any pressure on the walls of the larynx. It rested on top of the cords. It would seem that the prognosis in regard to the recovery of the voice was good, for there had been no lateral pressure. What necrosis exists is probably superficial and the cords will probably return to a practically normal condition.

DR. CARTER said that he saw the case before and after the extraction of the coin, and it was a matter of astonishment to him that a coin lying transversely in the larynx could remain there for eighteen months without causing serious disturbance. He had practically no voice before its

removal, but it was improving and he would probably recover it entirely, for Dr. Carter believes that the ulceration involves only the superficial epithelium, and that there will be no subsequent cicatricial contraction.

Dr. SIMPSON, referring to the patient's breathing comfortably with so small an opening, said that he remembered distinctly the results of Dr. O'Dwyer's observations in a number of cases. Adults can breathe comfortably with a very small lumen in the larynx, if this lumen remains stationary. The great danger lies in having an exacerbation of the laryngeal inflammation.

Dr. MACKENY said that the patient had seen a general practitioner, and a nose and throat man, who told him that he should have his tonsils removed. He did not understand how the condition escaped attention. As Dr. Simpson had said, the size of the opening was very small. One peculiar feature was that the patient could only lie on his right side; if he lay on back or left side he would have a spasm. The vocal cord is somewhat ulcerated, and there is considerable thickening of the false cord which may not entirely disappear. If later it does not disappear, it may be possible to remove some of the thickening and allow the cords to be approximated.

Laryngeal Papilloma in a Child. Treatment By Direct Laryngoscopy and Tracheotomy. DR. JOHN MCCOY.

Dr. McCoy said that the case was not reported as a cured laryngeal papilloma as yet. It was still under treatment, but was presented for the attention of the Section and also perhaps for suggestions as to the ultimate cure. Thomas F., age, 5, came to the clinic several months ago with a history that his voice had changed two years ago, that he had great difficulty in talking, and that lately his respiration was becoming more and more embarrassed. It was necessary for him to make a strong muscular effort to get air into his lungs. Examination revealed a mass of papilloma in the larynx. He also had a mass of adenoid tissue and large tonsils. It was decided to use direct laryngoscopy in order to remove the papilloma. The boy was placed under an anesthetic (chloroform) and this was watched very carefully. The growth was removed as far as it could be seen, and his breathing became easier. After he was dismissed from the hospital he was seen for several weeks, and after four or five weeks his tonsils and adenoids were removed. About two months after the original operation, his larynx was apparently as badly filled with polypi as before, and his breathing was very labored. It was decided that it was not wise to risk anesthesia without a tracheotomy, so a tracheotomy was performed and he was anesthetized through the tube; the papilloma was again removed and the larynx placed in a condition of physiological rest. The case apparently improved to the extent that the papilloma formed very much more slowly, so that it has taken perhaps three months for the larynx to again fill up. The mother brings him irregularly to the clinic. Last week he was again placed under anesthesia and the papillomata again removed. They were very extensive and involved the true and false cords and the aryteno-epiglottic fold. That brings the case up to date.

Several methods of treating the case now suggest themselves, one being the fulguration treatment. The larynx is fairly well cleaned out now.

Radium also has been considered; another method suggested is one that is now being tried in France—tying off the laryngeal arteries, which would perhaps give a much quicker result with fulguration treatment later.

The child is now wearing a tracheotomy tube with comfort; he eats and sleeps well, and is apparently well and happy, compared to his condition when first seen. Dr. McCoy hopes to present him to the Section at a later date, with the condition entirely cured.

DISCUSSION.

DR. McCULLAGH said that Dr. McCoy had mentioned the possibility of using radium in this case, and told of a case of papilloma of the larynx treated with radium which produced a most wonderful result. The woman was one of Dr. Harris' patients whom he had treated during the summer. She gave a positive Wassermann, and it was thought that the growth was a specific granuloma; so she was treated on that basis, with good general treatment but no benefit resulted. When Dr. Harris returned, he removed a piece of the growth for examination. Dr. Abbe applied radium, and the growth has absolutely melted away. Dr. Abbe says that the beneficial effect will continue for some time.

Dr. McCullagh also told of a case in which he had tried physiological rest, putting in a tracheotomy tube about three months ago and removing a small portion of the growth for examination. He saw the case about ten days or two weeks ago and the larynx was practically clear. He was now considering the advisability of removing the tube and closing the wound.

DR. FREUDENTHAL said that a year ago Dr. Abbe had reported the case to which Dr. McCullagh had referred. One cannot always expect such results, according to Dr. F.'s opinion. It takes a much longer time to effect a cure by means of radium, even in benign tumors. The difficulty here would be how to apply the radium in the larynx of the child. One cannot give the child cocaine, and it might have to be given under general anesthesia. The same would be true in regard to the fulguration treatment. He would like to see the appearance of the larynx in such a case under suspension. It would be interesting to see if some growth could not be found which was not visible under indirect inspection.

DR. YANKAUER said that whatever might be the theory of physiological rest in these cases of papilloma of the larynx, the case which he had operated on that afternoon argued against such a theory. The patient was a girl, 19 years of age, who at 2 years of age, had had some glands removed from the side of her neck. Shortly after dyspnea developed and a tracheotomy was done. Since that time it has not been possible to remove the tracheotomy tube. She lived in the West and came to New York City for the purpose of having the tube removed. The entire larynx was filled with an enormous mass of papilloma, which had evidently been there since she was 2 years of age. She had been wearing the tube ever since, and her larynx has been at rest for a long time.

Referring to what Dr. Freudenthal had said about suspension in such a case, he said that he had used that method in the afternoon, and had removed the entire papillomatous mass. He had never before operated

on a laryngeal mass in that way, though it was the second or third time that he had used the suspension method. One of the cases had been a laryngeal carcinoma. The method of operating in this case was entirely different from anything which would have been done by any other method, and was most satisfactory. The case was a patient of Dr. Emil Mayer, and he would report it in due time. The patient developed an ulceration on the epiglottis which proved to be carcinomatous. He was anesthetized and suspended, the epiglottis was seized with the forceps and steadied with one hand, and with the other hand an incision was made in the frenum.

The soft tissues were separated from the cartilage of the epiglottis as far as possible. Then the epiglottis was drawn to one side, the mucous membrane severed with a knife; then it was drawn to the other side and opposite mucous membrane incised; then the whole mass was removed in one piece by cutting the pedicle with the scissors. It was done just as one would remove a growth on the outside of the body, and the patient is apparently making a good recovery. It was an entirely different proposition from anything that had been done previously. When the patient, operated upon that afternoon, had been suspended, the entire outline of the larynx was obscured, but with a probe the extent of the attachment of the papillomatous mass could be easily seen. The snare was put around it, and it was cut off. The second bite of the snare removed the greater part of the growth, which was attached to the posterior wall. After checking the bleeding, by clamping the bleeding vessels, the remainder of the growth was carefully pinched off and curetted away; the high frequency current was then applied and the larynx fulgured. The patient is doing well to-night.

Suspension laryngoscopy is certainly one of the greatest advances made in laryngoscopy, and those who have not had any experience with it should certainly learn the method, for no other method of operating in the larynx can compare with it.

DR. SMITH said that for several years he had been greatly interested in multiple papilloma of the larynx in children. In the past few years he had had in his clinic at the Manhattan Eye, Ear and Throat Hospital, eight cases, practically divided into two series. In the first three cases, tracheotomy had been done almost upon the admission to the hospital, after which the growths had been removed by the direct method at varying intervals in accordance with the rapidity of their recurrence. In each instance the growths had recurred, after operation, in greater number and had extended to new regions of the laryngeal mucosa wherever it had been wounded. During this series, when he was removing these growths, frequently there had occurred upon his hands, a number of small warts, which would tend to show that there was a certain infectivity in the growth or in the blood of the growth. In one of these cases the growths had suddenly disappeared from the larynx upon one application of fulguration which led him to believe that this method might be a sure way of eradicating papilloma. The next case had been one of inherited syphilitic papilloma of both vocal cords which had disappeared upon one injection of salvarsan.

The second series consisted of four cases. These had been treated by the direct removal of the growths and an application of fulguration, but recurrence had invariably taken place. The interval between the application of the spark and recurrence had seemed to be longer than when mere removal by forceps had been accomplished. In one of these cases the child had developed diphtheria and was sent to the Willard Parker Hospital where it died. Another had pulled the tracheal tube out of place during sleep and before the house surgeon could reach the patient he had died. The third case had developed measles and had been sent to the Willard Parker Hospital but had not yet returned. The fourth case was in a boy 12 years of age and the growths had entirely disappeared under an application of fulguration and the larynx has remained free for a space of two months.

Dr. Smith said that up to the present the insertion of a tracheal tube still remains the only sure and positive way of eradicating these growths, although he believes that fulguration will lessen the time requisite for wearing the tube. While there were occasional instances where patients had worn the tracheal tube for years without disappearance of the growths, in the vast majority of cases it was only necessary to wear it from one to two years. Dr. Smith said he did not believe that the approach of puberty had anything to do with the disappearance of the growths, but that rest of the larynx for a certain period, which varied in different cases, was all that was essential to bring about the physiological change which occasioned their disappearance. In some of the cases he had tried *Thuja occidentalis*, in others alcohol as recommended by Delavan, and in some castor-oil, but there had been no appreciable benefit from the employment of any of these remedies.

Dr. Smith said, in regard to the tracheal or laryngeal collapse, that if the tube were frequently removed, which allowed the rings of the trachea to perform their physiological functions, the final withdrawal would be attended with much less respiratory difficulty than if the tube was left *in situ* continuously; that in all of his cases the tube was removed for varying lengths of time previous to the final withdrawal, and that in each instance the tracheal wound had closed up and the voice had become fairly good. In one case only had it been necessary to do a plastic operation to close the wound.

Dr. GUENTZER said that he had not had any personal experience in treating these cases of papilloma, but in the majority of them the treatment suggested to-night seems to apply to those cases that occur in the larynx above the cords. In the Manhattan Eye, Ear and Throat Hospital is a specimen of a larynx taken from a child, and one can see that there the vegetations were not only above the cords, but extended an inch below, and appeared in isolated places. In such cases, no matter how thoroughly the growth above the cords was removed, they would eventually recur.

Dr. SMITH said that he had detected these growths frequently in the tracheal wound and had snared them off, both from above and below, and they had always recurred rapidly. An idea had occurred to him in regard to these cases based upon the apparent infectivity of the growth, that if

an emulsion of the growth was made and injected into either the larynx or into the veins of the child that it might act in the same manner as the cancer emulsion recommended by Beebe; that unquestionably there was something infective in the growths and that while the organism had not been isolated there might be something accomplished by an autogenous injection of an emulsion made from the wart.

DR. GUENTZER said that he had seen a reference in a French journal, where *magnesia usta* was given internally and locally.

DR. YANKAUER said that he had tried that, and it had no effect. He also tried it in a small papillomata, but it had no effect there either.

DR. MCCOY expressed his appreciation of the interest shown by the discussion. The observation made by Dr. Guentzer tended to show that the tracheotomy should be made as low as possible, for in some of these cases where a tracheotomy was done, the papillomata caused later a serious difficulty. In these cases the growth extended below the cord, and the only instrument which could be used was one of the little forceps which he had devised with the use of the knife, and this took them off very nicely.

He expressed the intention of trying the fulguration treatment on the little fellow he had presented, and would show him again to the Section. He hoped to be able to present him as a cured case.

Foreign Body in Right Bronchus: Lower Bronchoscopy: Successful Extraction. By DR. GERHARD H. COCKS.

The patient, a boy 2 years of age, of Italian parentage, living in Mount Vernon, N. Y., was brought to Dr. Chappell's clinic at the Manhattan Eye, Ear and Throat Hospital on February 3, 1913. From the mother, who spoke but little English, it was learned that the child had been sick with a cough and labored breathing for the past twenty-four hours. He had been crying, and peanut candy was given to him to quiet him. He coughed violently after receiving the candy, and it was feared that some of the candy might have entered his larynx.

He was a well-nourished child; temperature 101° F., respiration 28; pulse 128. Examination of the chest was negative. The respirations were somewhat noisy and slightly labored. The diagnosis was considered doubtful, in view of the uncertain history. Laryngeal diphtheria, beginning pneumonia, and a foreign body in the respiratory tract, were the three possibilities considered.

Under chloroform narcosis, a Bruenings tube was passed into the larynx on February 3. The larynx and upper part of the trachea were free from any foreign body. During the examination large lumps of mucus were coughed up into the tube almost constantly. A severe attack of dyspnea ensued during which the tube was withdrawn, covered with pus. Culture showed pneumococci. On account of the patient's poor condition and the uncertainty of diagnosis, the operation was discontinued and the child was returned to the ward. During the next four or five days he suffered from a diffuse bronchitis, with the characteristic physical signs. The temperature reached normal on February 8.

At this time, physical examination of the chest elicited pronounced dullness over the right lung, especially in front, with diminished breath

sounds on the right side. The x-ray picture was negative. The child now began to suffer from attacks of severe coughing, attended by considerable dyspnea. On February 11, eight days after admission to the hospital, it being reasonably certain some foreign body was in the right bronchus, Dr. Cocks, assisted by Dr. MacKenty, Dr. Phelps, and the house staff prepared to again introduce a bronchoscopic tube. As soon as the tube reached the epiglottis, the child was seized with a violent coughing spell, choked, stopped breathing, and became deeply cyanosed. The tube was immediately withdrawn from the mouth and a quick tracheotomy was performed, barely in time to save the boy's life.

Through the tracheal opening, the trachea and bronchi were explored with the bronchoscope. The tube entered with ease into the trachea and left bronchus, both of which were free. The right bronchus, however, could not be entered by the tube for any considerable distance, owing to the inflamed and swollen character of its mucosal lining. The bronchoscope was then passed through the tracheal opening up toward the larynx. The tube quickly filled with blood and mucus. As the suction pump failed to clear out the blood, the tube was withdrawn and cleansed with a cotton applicator. One half of a peanut, broken into two pieces was pushed out of the tube. The child was not in especially good condition, and the operation was discontinued after the insertion of a tracheal cannula, which was allowed to remain for forty-eight hours.

During the next six days the child suffered from a broncho-pneumonia involving both lungs, from which, however, he made a good recovery.

On February 18 the temperature, which had been normal for twenty-four hours, suddenly shot up to over 104° , and exhibited this characteristic every forty-eight hours. Careful search of the blood failed to disclose any malarial plasmodia. In view of the characteristic malarial temperature and the fact that the child's home was at Mount Vernon, N. Y., he was given quinin with prompt subsidence of the fever. On March 5, he was discharged from the hospital. Two days later the tracheal wound was completely closed.

It was believed that during the second narcosis, owing to the relaxation induced by the anesthetic, the foreign body was dislodged from its position in the right bronchus by the attack of coughing. It was then carried to the upper part of the trachea, just below the vocal cords, where it plugged the glottis and induced the almost fatal choking attack which necessitated tracheotomy.

DISCUSSION.

DR. YANKAUER asked if the tube was passed into the trachea at the first operation, to which Dr. Cocks replied in the negative, saying that he simply got a good view of the larynx.

DR. YANKAUER responded that he had asked the question because the authorities in Europe are in favor of performing tracheotomy in children immediately in case of foreign body, as in children it is likely to set up a subglottic swelling. He himself had experienced no such difficulty, although he had kept the bronchoscope in place for as long as an hour and a half, with no ill results. He thought that the bad results which some obtained were due to the use of double tubes, which are now al-

most universally employed; for at the point where the inner tube emerges from the outer tube there is a decided thickening, and this ridge lies a short distance below the vocal cords and is rubbed up and down, thereby producing a subglottic swelling. Dr. Cocks, however, had said that he did not use the tube in the first instance. The accident which occurred on the second attempt, was, of course, due to the fact that the foreign body was coughed up, and if the tube had been got through the larynx at that time it would have been coughed out; when such a spasm occurs, it is difficult to get through the cords with any sort of tube. The patient was fortunate in dislodging the foreign body.

DR. MAC KENTY said that he saw the right bronchus, and there was no question about its being practically closed. The way the child acted and its position seemed to point to the fact that it had dislodged the foreign body from the bronchus. The child's chest was examined before the operation two or three times, and there was limitation of movement all over the right lung, showing distinct obstruction. The foreign body was in the larynx while it was being sought for down below.

DR. COCKS said that after operating on this case he had noticed a statement made by Dr. Ingals, who said that in his experience with children under 2 years of age he had found it impossible to remove foreign bodies from the bronchus without performing a tracheotomy and working through the tracheal opening.

DR. MAC KENTY told of two cases under his care which he had so treated at Dr. Smith's suggestion. The cases were inoperable. No sloughing appeared but the part turned white under the point of injection. Both cases resulted very satisfactorily, and there was no ill effect from the use of the monochloroacetic acid.

DR. MAC KENTY asked if the patient had been put upon specific treatment. In spite of the fact that the Wassermann was negative the case looked very suspicious of specific disease. Then again, might not the folliculitis of the nose be due to the chronic sinusitis. He also asked whether Dr. Feudenthal knew at the beginning that there was any sinusitis, or whether that question came up after the folliculitis of the nose appeared.

DR. MAC KENTY said that he had seen Dr. Guentzer's case when the patient first came to the hospital, and he thought the angry appearance of the granuloma was somewhat diminished; there was also less swelling. The condition seemed less active than before the injection.

Regular Meeting, April 23, 1913.

Cases Showing Results of Treatment of Chronic Stenosis of the Larynx.

DR. HENRY L. LYNNAH.

Case 1: Theresa D., aged 4 years, ill three days. Admitted to the Willard Parker Hospital December 18, 1911. Intubated for laryngeal diphtheria with a 4-5 O'Dwyer tube.

The patient was unable to remain without the tube on the first extubation owing to spasm of the adductors. The spasm of the adductors

was so persistent that she was treated by a cut-out posterior abductor tube. After two months' treatment with this tube the spasm improved and she was able to remain without the tube for three days, but owing to gradual hypertrophic contraction reintubation was necessary, and treatment by dilating tubes was resorted to in order to overcome this condition. These tubes were gradually increased in size, but owing to the marked spasm element, narrow neck and cut-out tubes were used alternately with the dilating tubes, to allow for play of the vocal cords and arytenoid cartilages. This treatment was carried on for a period of four months. The spasm seemed to have been more aggravated by the dilating tubes and their use was discontinued, and the cut-out and narrow neck tubes were used only without any dilatation. These tubes were used for two months, after which period the time-interval gradually lengthened between extubation and re-intubation.

On June 20, the patient remained without the tube for a period of twenty-four hours, but owing to a delayed spasm it was necessary to re-intubate. As the adductor spasm had improved and the hypertrophic contraction was no longer bothersome, the same treatment by narrow neck tubes was continued. On August 6, 1912, the tube was removed and the patient breathed quite naturally and has remained without the tube ever since.

December, 1912, the patient developed broncho-pneumonia and empyema and was readmitted to the hospital. There was no dyspnea at this time and the larynx had presumably returned to normal, though at times there was some slight spasm of the adductors when the child became excited. The voice is good, though of slightly husky quality. Duration of treatment nine months. The patient has been without the tube for eight months.

Case 2: Lilly C., aged 6 years, ill four days. Admitted to the Willard Parker Hospital December 14, 1910. Intubated for laryngeal diphtheria. This patient was also unable to remain without the tube on the first extubation owing to a marked nervous element which promoted a very violent adductor spasm. This condition was treated by abductor tubes but the nervous element was difficult to overcome and re-intubation was at all times an immediate necessity.

By April, 1911, the spasm element had been overcome and the patient remained without the tube for three days, but slow progressive spells of inspiratory and expiratory dyspnea necessitated re-intubation, and later gradual dilatation. Three days later a direct laryngeal examination under anesthesia revealed a mass of hypertrophic polypoid tissue at the base of the epiglottis and ventricular bands. Large dilating and built-up head tubes were used to mash out these masses and produce atrophy, for pressure on this very vascular tissue will produce absorption by cutting off the blood supply.

After three months treatment by dilatation the child remained without the tube for five days, the gradual contraction necessitating re-intubation. Dilatation was continued with an increase of one millimeter once a week. This treatment was continued until November 20, when the patient was extubated and allowed to remain without the tube. This

time the little girl was unable to remain without the tube, as she had done at the former trial, for the increased dilatation had also increased the fatigue of the abductors and the opposing set of muscles resulting in a violent spasm. Narrow neck and cut-out tubes were used, but unfortunately when the spasm was overcome the gradual hypertrophic contraction would necessitate continued dilatation. This treatment by dilatation and narrow neck tubes was continued for a period of nine months the patient being able to remain without the tube for intervals of from five to ten days during this period. September 29, 1912. After another month of treatment by enormous dilatation the child was able to remain without the tube for thirty-two days, but owing to gradual new connective tissue contraction, it was necessary to re-intubate, which was extremely difficult even with a very small one-year tube. Once more dilatation was resorted to, alternating with narrow neck tubes. On November 15, 1912, the tube was removed and the patient broke her record of thirty-two days, for she has remained without the tube ever since. Duration of treatment, one year and eleven months. Without tube for five months. She has a very good voice and there is no stridor at the present time.

Case 3: Bertha E., aged 6½ years, ill five days. Admitted to the Willard Parker Hospital May 13, 1909. Intubated for laryngeal diphtheria with a 6-7 O'Dwyer tube.

The patient had a severe attack of laryngeal diphtheria and commenced auto-extubation on the tenth day of the disease. This auto-extubation was persistent and the patient would cough out the tube from eight to ten times in the twenty-four hours. This condition was due to perichondritis at the cricoid. At times when the tube was coughed out the patient was able to remain without it for a few hours; this was before the absorption was complete, but later, a marked nervous element accompanied by very violent spasm of the adductors necessitated immediate re-intubation. Often the child would border upon a convulsion when put upon the table for intubation after the tube had been coughed up, and she was practically dead more than once before the mouth-gag could be inserted between the jaws and intubation performed.

Later on, in June, after the cough-up stage had passed, the spasm of the adductors became so violent that it was extremely difficult to remove the tube from the larynx. When the tube, after great difficulty, was finally removed, there would be a loud inspiratory stridor and a few minutes later the spasm would necessitate re-intubation. This condition persisted and the patient was unable to remain without the tube longer than 15 minutes. Narrow neck tubes were used in an endeavor to improve this condition. On November 28, 1909, six months later the spasm had slightly improved, but hypertrophic contraction, the result of the persistent auto-extubation stage, necessitated treatment by dilatation. This was continued for another six months, with the interval between extubation and re-intubation varying from six to twenty-four hours.

May 29, 1910. The parents made a fuss about taking the child home, for they complained that she did not improve, and had been in the hospital long enough. I protested, but the mother had made up her mind

to take the child home and was so persistent in her efforts that finally the superintendent of the hospital granted this privilege and the parents assumed all responsibility for the care of the child, with the tube in, while at home. The child remained at home for one year, the tube having been changed once each month. I finally persuaded the mother to give us another chance and the patient was readmitted to the hospital October 29, 1911. On this date dilatation was once more resorted to. "Special tubes" with built-up heads were used. These tubes dilated antero-posterior as well as laterally. The regular tube of O'Dwyer had been in the larynx since the time the mother took the child from the hospital. These "special tubes" were gradually increased in size once each week until the greatest possible dilatation was accomplished, then the sizes were reduced and narrow-neck tubes introduced. After six months treatment the patient was able to leave the intubation table for the longest period since admission and remained without the tube for three days, but gradual hypertrophic contraction necessitated re-intubation.

In June, 1912, after two months of treatment with tubes of enormous diameters, the patient was able to remain without the tube for twenty-eight days, but once more gradual contraction necessitated re-intubation and the treatment was repeated. In August, two months later, the patient coughed out the dilating tube and has remained without the tube ever since. Duration of intubation was $3\frac{1}{4}$ years. The child has a normal voice and has been without the tube for $8\frac{1}{2}$ months.

Case 4: Mary R., aged $3\frac{1}{2}$ years. Ill four days. Admitted to the Willard Parker Hospital June 26, 1911. Intubated with a 3-year O'Dwyer tube. The patient was one of the auto-extubation type during the first month, and coughed up the tube on an average of from two to eight times per day. On August 2, after the cough-up stage had subsided, it was necessary to use narrow-neck tubes owing to spasm of the adductors. After two months' treatment with these tubes the spasm improved and the child was able to remain without the tube for four days, but hypertrophic contraction caused re-intubation at the end of this period. The treatment was now alternated with dilating and narrow-neck tubes and carried on for two more months with the interval between extubation and intubation gradually becoming longer in duration.

By December 15, 1911, the child had remained without the tube for six days, the longest time since admission. The spasm element had been overcome but the hypertrophic contraction had not been overcome, and this seemed to be the factor to deal with at the present time.

June 10, 1912, the tube was removed and it was unnecessary to replace it for ten days, this being due to gradual contraction, and intubation was extremely difficult. The treatment from now on was by greatly increased dilatation. The intervals between extubation and re-intubation gradually increased in length and after five months the patient remained without the tube.

Duration of treatment 1 year and 8 months. The patient has been without the tube for three and one-half months. I have never heard the child speak, though the nurses tell me that she has a good voice.

DISCUSSION.

DR. HARMON SMITH thought that Dr. Lynah was certainly to be congratulated on the outcome of these cases, but for the sake of individual enlightenment he would like to ask (1) whether more cicatricial stenoses are found in young children than in older ones, also whether it is easier to overcome a stenosis in the younger children?; (2) Where does the stenosis most frequently occur?; (3) If the stenosis is removed, what length of time ordinarily elapses before the recurrence, or how long before the fibrous elements incident to the primary stenosis pull the larynx together?

DR. HERZIG inquired how often the tube was changed, and DR. LYNAB replied, once a week.

DR. EMIL MAYER asked Dr. Lynah how long the tube should be worn before taking the chances of removing it. In his own experience, no set time could be established, but too prolonged wearing of the tube, four or five weeks, seems to be followed by bad results.

DR. THURBER asked if there was not some abductor paralysis from pressure, otherwise would the adductor spasm last so long. These spasms seemed to show decidedly weakened abductors.

DR. CARTER asked if in any of these cases there was a tendency for the membrane to spread down into the trachea, and, if so, would the treatment adopted in these cases have been effective, also whether the prompt administration of anti-toxin would have caused the membrane to be loosened and coughed out?

DR. LYNAB, replying to Dr. Smith, said that the types of cases all seemed to be about the same. The difference depended on how long the hypertrophic condition had lasted. During the past year he had had sixty-two subacute cases. These patients wore tubes from two weeks to two months and then recovered without any special treatment. The very mild cases get well practically by themselves. So far as the age of the child was concerned, it was easier to treat the older than the younger children, but he had two cases in older children who had worn tubes for a period of five years.

The duration of treatment depended upon the degree of adductor spasm and the pathological changes in the mucosa, sub-mucosa, and cartilage. There is thickening of the mucosa and submucosa, even in the early cases, or ulceration may be rapid and bring about perichondritis of the cartilages with new bone formation taking the place of the former cartilage. There was no recurrent laryngeal nerve paralysis, the adductor spasm being caused by the functional disuse of the abductors.

Some x-ray pictures have shown shadows of bony development at the cricoid level.

The case cited by Dr. Mayer was extremely interesting because of its being a chronic tracheal canula case. Dr. Mayer said that the child had been in the hospital for one month and that he had dilated from below upward by means of sounds, he had also used a uterine dilator from above downward and suspension laryngoscopy which had given a splendid view of the larynx while he was dilating. Dr. Lynah said such a case

should be dilated to the extreme limit with intubation tubes, but at the same time narrow neck tubes should be used to overcome the amount of tension put upon the intra-laryngeal muscles.

Dr. Lynah said that these cicatrix cases require from two to three years to effect a cure but some of the purely hypertrophic types he had treated for five years before they recovered. The voice, however, is always better in cases treated by dilatation, and occasionally in the cicatrix type the voice may be lost.

Section of the nerve in the cough-up cases showed that the nerve was perfectly normal. It was surprising to see the muscles present. They showed some myocytis. There was no bilateral abductor paralysis and the condition seemed to be due to functional disuse of the muscles, as when an arm is fixed in a splint. The tube acts as this splint to the intra-laryngeal muscles. The purpose of my cut-out posterior tube is to allow for play of the muscles and motion to the arytenoid cartilages.

Replying to Dr. Carter, Dr. Lynah said that none of the cases presented had had tracheal or bronchial stenosis; in fact most of the tracheal and bronchial types of diphtheria died from mechanical obstruction to respiration or later from broncho-pneumonia. He doubted whether antitoxin had much effect in such cases for owing to the passive congestion of the lungs the absorption of antitoxin must be extremely slow.

(To be continued).

Intra-tracheal Insufflation Anesthesia. F. J. COTTON and W. M. BOOTHBY, *Ann. of Surg.*, Jan., 1913.

The authors draw the following conclusions: (1) Intra-tracheal insufflation respiration is the only artificial method that absolutely provides for a sufficient aeration of the lungs, regardless of the respiratory movements of the patient, and that, properly administered and safe-guarded, can be rendered devoid of intrinsic danger. 2. Therefore, anesthesia by this method is indicated whenever the operation is about to interfere in any way with the ability of the patient to voluntarily respire, and should be used in all intrathoracic work and in extensive operations about the head, neck, and mouth. Ether with air, preferably supplied by a foot-pump, is the most applicable of the various anesthetics for general use, though nitrous oxid-oxygen with minimal quantities of ether may also be used. To prevent deaths from emphysema, no matter what form of apparatus be used it must be provided with a safety-valve by means of which the intrathoracic pressure cannot exceed 15 mm. mercury.

ED.

XV. INTERNATIONAL CONGRESS OF MEDICINE, LONDON

SECTION ON RHINOLOGY AND LARYNGOLOGY.

Annual Meeting.

Introductory Remarks by the President

Sir St. Clair Thomson.

The last time that the International Congress of Medicine was held in London was in 1881, when, as a student, I attended some of the meetings. Although there were separate sections for Otology, Ophthalmology, Dermatology and Odontology, yet 32 years ago our special department of practice had not attained to a separate, autonomous section. Rhinology was hardly recognized and laryngology was relegated to a sub-section and had no president. The sittings were presided over by a Chairman selected from the Vice-Presidents of the Section of Medicine. That Chairman was Sir George Johnson, my own chief, who, however, desired to be known as a general physician although his observation on the innervation of the larynx are worthy of remembrance. The number of laryngologists who inscribed their names as members of this sub-section, this Cinderella of the specialities, was 342 and the average daily attendance at the sittings varied from 60 to 100. To-day already 230 have inscribed their names, and judging from this morning's gathering our attendance will be numbered in hundreds.

In the year 1881 eighteen hours was given up to discussing 38 papers. This year we are prepared to devote 30 hours debating 5 reports and 34 communications.

The Chairman of 1881 has been gathered to his forefathers, but all the three secretaries of that occasion are, I rejoice to say, still amongst us and in the full enjoyment of health and vigour. Dr. de Havilland Hall has been lured into the wider field of internal medicine; Dr. T. J. Walker in the provincial town of Peterborough where I commenced my studies of medicine as his pupil, has won renown as a general surgeon, but Sir Felix Semon has continued to be the devoted apostle of laryngology and in his retirement from active practice he remains an attached follower and a detached critic.

It might be interesting if I briefly referred to the subjects of discussion in 1881 and left to all present to draw their own comparisons with the program of work we have before us to-day, in this way showing how swift and mighty has been the progress of rhino-laryngology in these 32 years.

The Chairman in his opening address in 1881 still felt it necessary to uphold the claims and benefits of the laryngoscope and Manuel Garcia again narrated how the possibility of viewing the living larynx flashed across his imagination while he was strolling in the garden of the Palais Royal, that historical September day in 1854. The local treatment of diphtheria now-a-days, thanks to the wonderful discovery of antitoxin, of such secondary, I might almost say, of such trifling importance, was one of the subjects of set discussion, and the rapporteurs were Morrell Mackenzie, Tobold and Lennox Browne. Krishaber, of Paris, announced

his firm conviction that tuberculosis of the larynx, while possibly healing in one part, yet always broke out in another, and so invariably ended fatally, generally within a year, although "quelques cas resistant deux ans."

A debate on laryngeal paralyses set the foundation of our now established classification of these affections and gave the early embodiment of what we know as the Semon law. It gives us pause to read that a subject of debate was "The Indications for Extra- or Intralaryngeal Treatment of Benign Tumors of the Larynx," when at present all the world knows that every simple growth can be removed by the intralaryngeal route according to the Hippocratic principle "cito, tutto et jucunde." But doubtless the subject was chosen to enlighten the medical public as to the possibilities of the laryngoscope, which was then only 25 years old.

Stenosis of the larynx, still in our day a *bête noire* to the laryngologist, was another subject of general discussion in 1881, one of the rapporteurs being our confrere Heryng, of Warsaw.

The indications for partial or complete extirpation of the larynx were discussed, but laryngo-fissure was not even mentioned during the debate. At that date and for some years afterwards, the operation was so disastrous that there was little anticipation of the brilliant results we now obtain.

At our previous London Congress the galvano-cautery had hardly started on its useful, although sometimes wild career, yet in a discussion introduced by Voltolini, Solis-Cohen, Cadier, Lennox Browne, Foulis and Victor Lange, one conclusion arrived at even 32 years ago was that the electric cautery was often used unnecessarily.

Adenoid vegetations were discussed in a masterly way by their discoverer, Wilhelm Meyer, followed by Loewenberg, Guye and Woakes.

The everlasting subject of ozena came in for consideration, and five other communications on various subjects completed the program.

It is interesting to note that in 1881 there was not a single communication on the surgery of the nose, on diseases of the accessory sinuses, on the bacteriology of the air passages, or on laryngo-fissures. At that date cocaine was unknown, adrenalin was undreamt of, and electricity was not available for illumination.

The trachea was only partly visible when reflected in the laryngeal mirror; but the hardihood of the early pioneers of rhino-laryngology is shown by the record that Morell Mackenzie and Stoerk showed their esophagoscopes and the former even exhibited a patient on whom he had performed internal esophagotomy.

What will mark the next stage of our progress I will not venture to predict. It only remains for me as spokesman of the Council of the Section and on behalf of all British laryngologists to bid you one and all a hearty welcome, and to assure you, in the words of Shakespeare, that "our true intent is all for your delight."

In a few well-chosen words the Chairman also spoke in German, French and Italian, summarizing his greetings to the Congressists attending from those foreign lands.

